


CORRESPONDENCE
IN PREPARATION
OF THESIS





386
L83
pt. 2

L I B R A R Y

B O S T O N
U N I V E R S I T Y



 COLLEGE 
BUSINESS
ADMINISTRATION

X
Class No. 386
Book No. L83 pt.2
Acc. No. 20034
Date 12 / 17 / 31

Correspondence
in preparation of
Thesis

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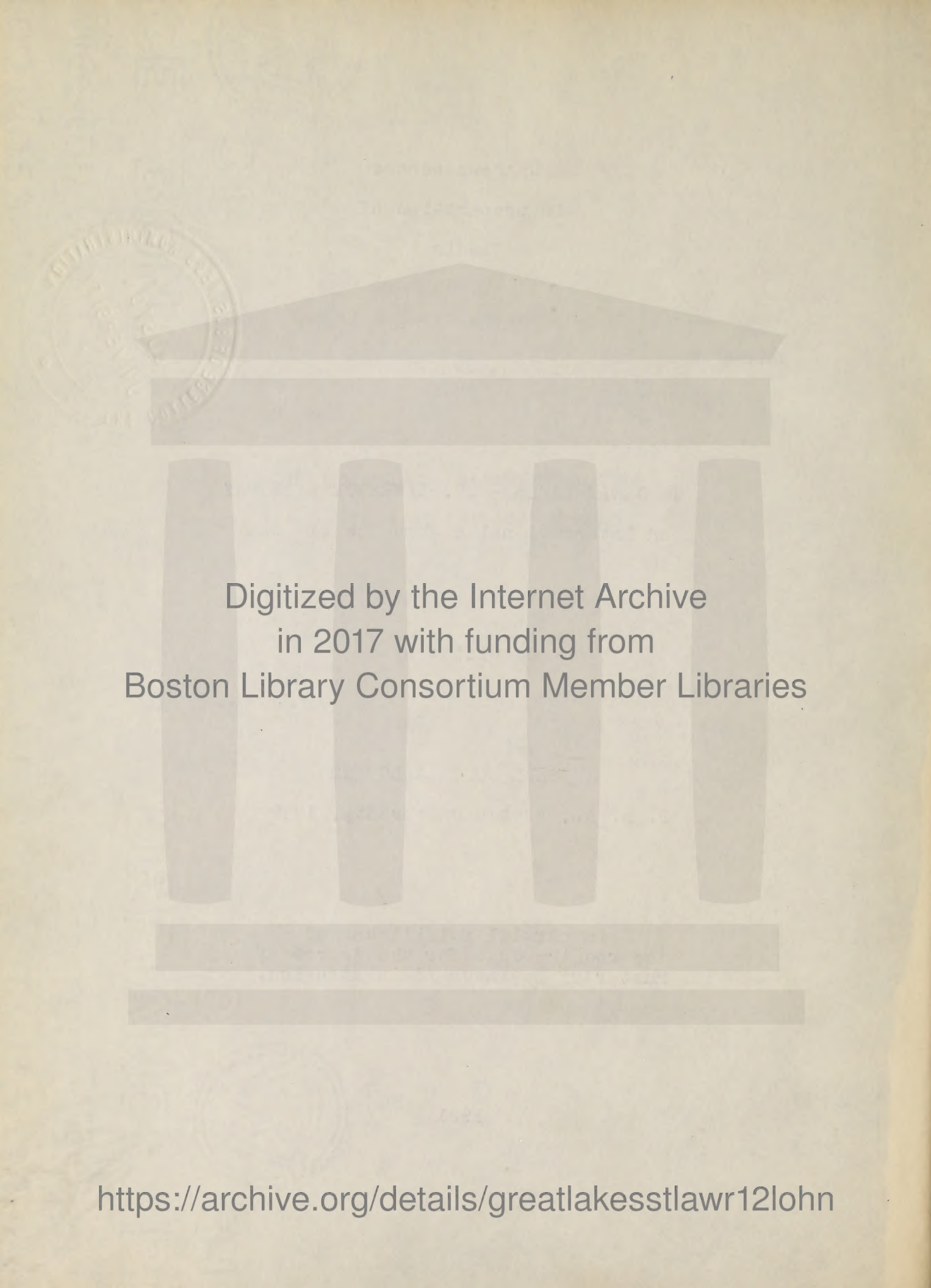
THE GREAT LAKES - ST. LAWRENCE WATERWAY
An International Highway to the Sea

Submitted by

RUSSELL COTTMAN LOHNES
B. B. A., Boston University, 1929

In partial fulfillment of
the requirements for the degree of
Master of Business Administration.

1931



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<https://archive.org/details/greatlakesstlawr12lohn>

12/17/31
20034
* 986
183 pt. 2

MBA
1931
16
correspondence

Executive Director

Great Lakes-St. Lawrence Tidewater Association

Munsey Building

Washington, D.C.

Dear Sir:

I am a graduate student at Boston University, matriculating for the degree of Master of Business Administration.

For my degree thesis I have chosen the subject "The Great Lakes-St. Lawrence Waterway Project", and it is in the hope of obtaining information on this subject that I am addressing you.

The points which are of particular interest to me are the history of the negotiations between Canada and the United States up to the present date, the economic benefits to be derived from the project, transportation advantages, and any other details which would be appropriate for my paper.

Any material which you can send me will be gratefully received.

Yours respectfully,

December 14, 1929
Russell C. Lohnes
271 Newbury St.
Boston, Mass.

Russell C. Lohnes.

GREAT LAKES-ST. LAWRENCE TIDEWATER ASSOCIATION

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VICE-PRESIDENT AT LARGE AND
EXECUTIVE DIRECTOR

December 17, 1929;

Mr. Russell C. Lohnes,
271 Newbury St.,
Boston, Mass.

My dear Sir:-

Acknowledging your request of 14th inst.

We are pleased to send you under separate cover a complete set of the economic, engineering and international phases of the Great Lakes - St. Lawrence Seaway project, which we hope will be useful to you in the preparation of your thesis on this subject.

I would first of all call your attention to the recent publication by Henry I. Harriman, President of the Boston Chamber of Commerce entitled "New England and the St. Lawrence Seaway" - going forward to you. This is a splendid study and shows the economic advantages to accrue to New England with the opening of the St. Lawrence River for both navigation and power.

Then I would refer you to our major production "Transportation Economics of the Great Lakes - St. Lawrence Ship Channel" by A. H. Ritter - a text book on the subject.

With reference to the history of negotiations between Canada and the United States, let me refer you to the Annual Reports of the Executive Director for the past two years. The report of March 30, 1928 carries the text of the diplomatic correspondence passing between Canada and the United States and the report of Dec. 17, 1928 analyzes the correspondence. My report for 1929 will be ready about the 10th of February - and it will bring the history of the project down to date.

In addition to the above mentioned, we are including special studies attacking the book published this past summer by the Brookings Institute of Washington, Harddd G. Moulton, Director.

If there are any special questions occurring to you, or other information which you need, we will be pleased to hear further from you.

Very truly yours,

Charles P. Craig
Executive Director.

Received Dec 20/29



To

Mr. Russell C. Lohnes,
271 Newbury St.,
Boston, Mass.

FROM

THE GREAT LAKES-ST. LAWRENCE TIDEWATER ASS'N

521-523 Munsey Building
WASHINGTON, D. C.

Executive Director

Great Lakes - St. Lawrence Tidewater Association

Munsey Building

Washington, D.C.

Dear Sir:

Your letter of the 17th December has been received, and the package of pamphlets has also arrived safely. Please accept my thanks for all the valuable information you have sent me. It is going to be of very great assistance to me in the preparation of my work.

It is my intention to develop the subject from both the American and Canadian points of view. In order to do this effectively I feel that I should communicate with the Canadian Deep Waterways Association which organization is referred to on page 1 of your annual report for the period ending December 17, 1928. Possibly from that Association I can get some ideas as to the Canadian reaction on the project, and if you can give me their address, I shall appreciate it very much.

Yours very truly,

December 22, 1929
Russell C. Lohnes
271 Newbury Street
Boston, Mass.

Russell C. Lohnes

GREAT LAKES-ST. LAWRENCE TIDEWATER ASSOCIATION

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CHARLES P. CRAIG
VICE-PRESIDENT AT LARGE AND
EXECUTIVE DIRECTOR

December 24, 1929.

Mr. Russell C. Lohmes,
271 Newbury St.,
Boston, Mass.

My dear Sir:-

Acknowledging yours of 22nd inst.

If you will address Hon. O. E. Fleming, K. C.
President of the Canadian Deep Waterways Association, 24
Chatham St., West., Windsor, Ont., Canada - I am sure you
will be able to secure from him a full line of the
economic and engineering studies published by that
Association with reference to the St. Lawrence project and
its relation to Canadian economics.

Very truly yours,

Charles P. Craig
Executive Director.

s.

U.S. Fish and Wildlife Service
Washington, D.C.

Form No. 100-10

Report of the Survey of Fish and Wildlife

The following information was obtained from the survey of fish and wildlife in the Great Lakes region during the year 1961. The survey was conducted by the U.S. Fish and Wildlife Service, Great Lakes Division, and the State Game and Fish Commissions of the Great Lakes States. The survey was designed to determine the status of the fish and wildlife resources in the Great Lakes region and to provide information for the development of a management plan for the resources.

For more information

see

316 Huntington Avenue
Boston, Massachusetts,
January 2, 1930.

Hon. O. E. Fleming, K. C.
President, Canadian Deep Waterways Association
24 Chatham Street, West
Windsor, Ontario.

Sir:

Your address has been given to me through the kindness of Mr. Charles P. Craig, Executive Director of the Great Lakes - St. Lawrence Tidewater Association, Washington, D. C.

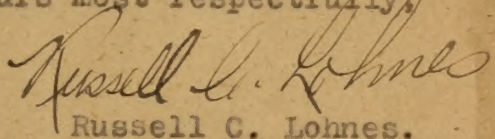
I am a native of Nova Scotia, though I have lived in the United States of America for several years during which time I have been getting my education. At present I am matriculating for the degree of Master of Business Administration at Boston University.

For my degree thesis I have chosen the subject "The Great Lakes - St. Lawrence Canal Project," and Mr. Craig has kindly sent me much valuable material with reference to the American point of view on this subject. It is my intention to incorporate in the thesis the Canadian opinion as well, for without this the work would be incomplete.

To assist me in developing the Canadian side of the question I would appreciate it very much if you can send me a full line of the economic and engineering studies as published by your Association.

I shall be grateful for whatever assistance you can give me.

Yours most respectfully


Russell C. Lohnes.

Received Jan. 10/30



From:-

O. E. Fleming,
24 Chatham St. West,
Windsor, Ontario.

Mr. Russell C. Lohnes,
316 Huntington Avenue,
BOSTON,
MASSACHUSETTS,
U. S. A.

PAMPHLETS.

Received Jan 10/30

316 Huntington Avenue
Boston, Massachusetts
January 4, 1930

Dominion of Canada
Department of Marine and Fisheries
Ottawa, Ontario

Dear Sirs:

Please send me the following official publications:

Bay of Fundy and its approaches,
Tables of Hourly Deviation and
Velocity of the Currents and
Time of Slack Water in the,- ✓

Light and Fog Signals, Corrected
Lists to the 1st April (for
Atlantic Coast) 1929 ✓

Marine Charts, Catalogue of. Sail-
ing Directions and Tidal Informa-
tion, etc. 1929 ✓

and very greatly oblige

Yours very truly,

Russell L. Lohmes.

Jan 13/30

Jan 13/30

James A. Johnson

316 Huntington Avenue
Boston, Massachusetts
January 4, 1930

Dominion of Canada
Department of the Interior
Ottawa, Ontario

Dear Sirs: Natural Resources Intelligence Service

Please send me the following official publications:

Central Canada, map showing transporta-
tion and Commercial Develop-
ment of The Hudson Bay Region

and very greatly oblige

Yours very truly,

Russell L. Lohme

316 Huntington Avenue
Boston, Massachusetts
January 4, 1930

Dominion of Canada
Bureau of Statistics
Ottawa, Ontario

Dear Sirs:

Please send me the following official publication:-

Maritime Provinces since Confederation
A Statistical Study of their Social and Economic Condition during the past Sixty Years

and very greatly oblige

Yours very truly,

Russell C. Lohnes

Received: Jan. 20, 1930

Publication on Maritime Provinces since Confederation.

Russell C. Lohnes, Esq.,

316 Huntington Avenue,

BOSTON, Massachusetts.

H. O. S.

**DOMINION BUREAU OF STATISTICS
OTTAWA, CANADA.**

Sent in response to your recent request.

R. H. Coats.
DOMINION STATISTICIAN

316 Huntington Avenue
Boston, Massachusetts
February 5, 1930

Dominion Bureau of Statistics
Ottawa, Canada

Dear Sirs:

I have now received the Publication on Maritime Provinces since Confederation, as requested in my letter of the 4th January, and I thank you very much for forwarding this booklet to me.

In explanation of my request for the publication I may say that I am a native of Nova Scotia, but have been in U.S.A. since 1921 getting my education. In a few years I intend to return to Canada, and I am, therefore, gathering information now in preparation for my return.

Yours very truly,

Russell C. Lobmes

316 Huntington Avenue
Boston, Massachusetts,
January 4, 1930.

Mr. F. A. Acland,
King's Printer,
Ottawa, Ontario,
Canada.

Dear Sir:

The enclosed United States Postal Money Order, Number 97734, is submitted herewith in payment for the following official publications, which I request that you send to the address indicated at the head of this letter:

Compass, The March of and Daily Variation Tables	\$0.10	✓
Freight, Carriage on the Great Lakes	1924 .25	✓
Hudson Strait Expedition, February, 1927 - November, 1928, in charge of N.B. McLean	.50	✓
Hudson Strait Expedition, Report of the - to December 31,	1927 .25	✓
Lake Grain Rates, Report of the Royal Com- mission	1923 .10	✓
Ocean Rates, Correspondence between Canada and the British Government	1925 .10	✓
Pilotage System and its Administration at the Port of Halifax, N.S.	1918 .10	✓
Great Lakes, Correspondence relating to Diversion of the Waters of the, by the Sanitary District of Chicago, from March 27, 1912, to October 17, 1927.	.25	✓
St. Lawrence River Improvement Scheme. Correspondence between the United States Government and the Government of Can- ada concerning the	.10	✓
St. Lawrence Waterway Project. Correspond- ence between the Governments of Canada and the United States, 1927-28, etc.	1928 .25	✓
Sixty Years of Canadian Progress, 1867 -	1927 .25	✓
Smuggling Operations along the International Boundary between the Dominion of Canada and the United States, Treaty for....	.10	✓
Total	\$2.35	

97734

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Received Jan. 20, 1930.

Yours Truly,

Russell L. Johnson.

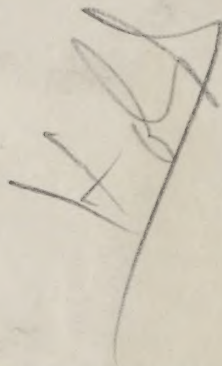
O. H. M. S.

PRINTED MATTER

F. A. Asland

From office of the King's Printer, Ottawa, Canada

Mr. Russell C. Lohnes,
316 Huntington Avenue,
Boston, Mass., U.S.A.



DEPARTMENT OF PUBLIC PRINTING AND STATIONERY
DÉPARTEMENT DES IMPRESSIONS ET DE LA PAPETERIE PUBLIQUES

N^o 5540

OFFICIAL RECEIPT

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Ottawa, Jan. 7th, 1930
CANADA

Received from } Russell C. Lohnes, Esq., Boston, Mass.
ou de }

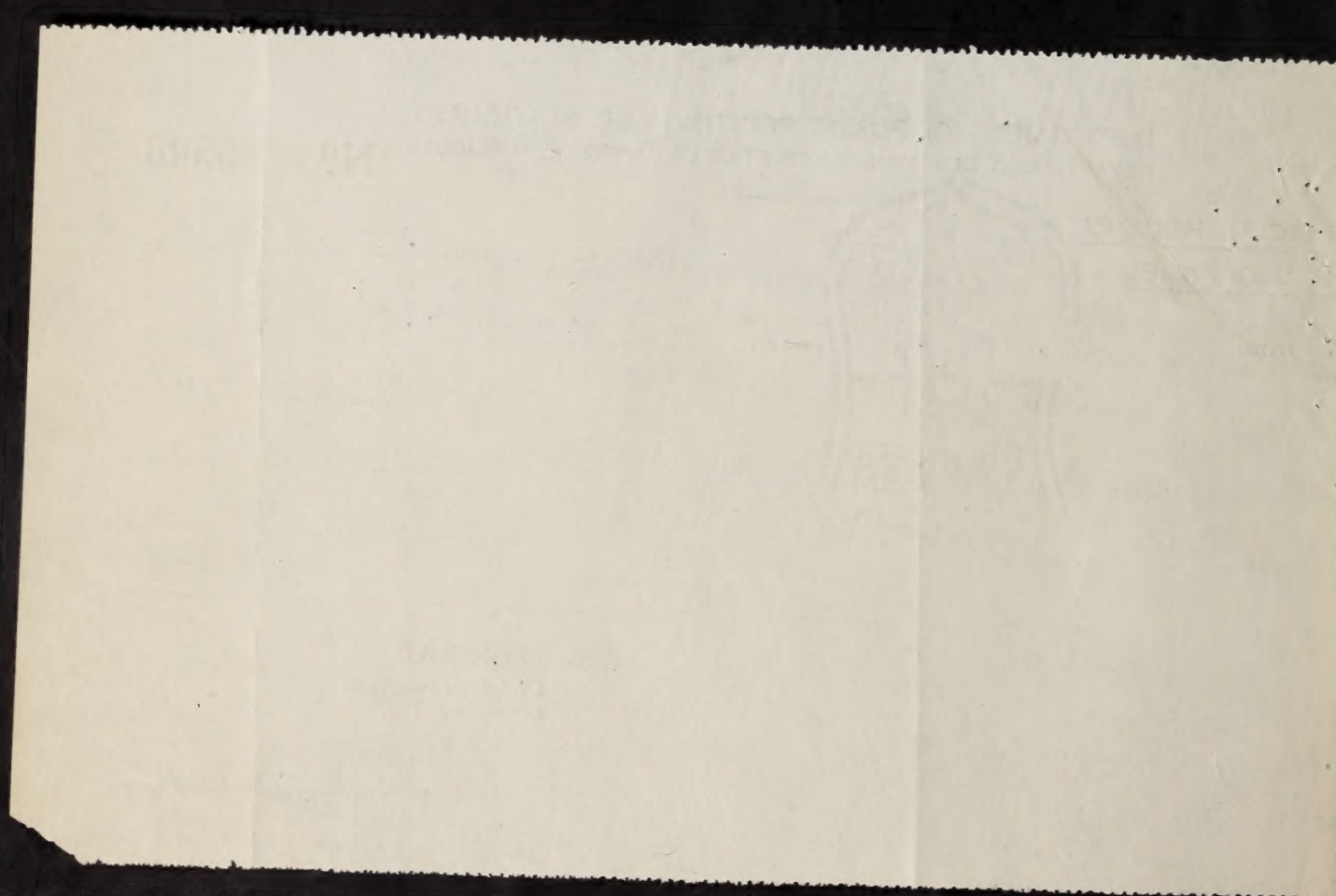
o 35/100 Dollars,

ir } Various Copies of Publications per letter of January 4th.

F. G. BRONSKILL,
Chief Accountant.
Comptable en chef.

2.35

Per..... P.L.



Mr. Russell C. Lphnes,
316 Huntington Ave.,
Boston, Mass., U.S.

Ottawa, Jan. 7th, 1930.

Dr. To Department of Public Printing and Stationery, Ottawa, Canada
Doit au Département des Impressions et de la Papeterie Publiques, Ottawa, Canada

QUANTITY QUANTITÉ	DESCRIPTION OF PUBLICATIONS DESCRIPTIONS DES PUBLICATIONS	PRICE PRIX	AMOUNT MONTANT
1	Copy-Compass The March of and Daily Variation Tables		10
1	" Freight, Carriage on the Great Lakes 1924		25
1	" Hudson Strait Expedition, Feb. 1927-Nov. 1928		50
1	" " " " 1927		25
1	" Lake Grain Rates, Report of Comm. 1923		10
1	" Ocean Rates, Correspondence etc. 1925		10
1	" Pilotage System and its administration 1918		10
1	" Great Lakes, Correspondence relating to Diversification of the Waters etc. in 1912-1927		25
1	" St. Lawrence River Improvement Scheme etc.		10
1	" St. Lawrence Waterway Project, 1928		25
1	" Sixty years of Canadian Progress		25
1	" Smuggling Operations along the International Boundary between Canada & U.S.		10
			2 35
	Receipt No. 5540		
	Accountant, please refund over remittance of 10¢ as first item is not available from this office.		

Address all correspondence to the King's Printer, Department of Public Printing and Stationery, Ottawa, Canada.
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Tout paiement devra être fait à l'ordre du Département. Mandats ou bons de poste préférés. Les timbres-poste ne sont pas acceptés.

1. The first part of the document is a list of names and dates, which appears to be a record of some kind. The names are written in a cursive hand, and the dates are in a more formal, printed style. The list is organized into columns, with names in the first column and dates in the second column. The names are: John Smith, James Brown, William Jones, Robert Taylor, and Thomas White. The dates are: 1810, 1811, 1812, 1813, and 1814. The list is followed by a section of text that is also written in cursive. This text appears to be a description of the events that took place during the period covered by the list. It mentions the names of the individuals listed in the first column and describes their actions and the results of those actions. The text is written in a cursive hand, and the ink is somewhat faded. The overall appearance of the document is that of an old, handwritten record.



Department of Public Printing and Stationery

ALL COMMUNICATIONS
TO BE ADDRESSED TO THE
KING'S PRINTER, OTTAWA.

OTTAWA, January 20th, 1930.

Ref. - Publications

Dear Sir,-

I have your letter of the 4th instant enclosing the sum of \$2.50 for which we forwarded you all the documents requested with the exception of the one entitled "Compass, The March of and Daily Variation Tables" selling at 10¢ which is no longer available. We are also asking our Accountant's Division to refund you the sum of 10¢ which was intended in payment of the above publication.

Yours truly,

L. Normandin,
Chief, Division of Documents.

Mr. Russell C. Lohnes,
316 Huntington Ave.,
Boston, Mass., U.S.A.

B.

316 Huntington Avenue,
Boston, Massachusetts,
January 7, 1930.

Mr. F. A. Acland
King's Printer
Ottawa, Ontario,
Canada.

Dear Sir:

Please send me the following official publications
for which I have enclosed with this letter a United
States Postal Money Order, Number 154238, for the amount
of \$3.55:

STATUTES OF CANADA.

Chap. No.	Title	Price
21	Canadian Nationals	\$0.10 ✓
186	Canada Shipping	1.00 ✓
63	Export	.10 ✓
7	Government Annuities	.10 ✓
208	Inland Water Freight Rates	.10 ✓
79	Maritime Freight Rates	.10 ✓
138	Naturalization	.25 ✓
140	Navigable Waters Protection	.10 ✓
143	Oaths of Allegiance	.10 ✓
29	Trust Companies	.25 ✓
207	Water-Carriage of Goods	.10 ✓

ANNUAL DEPARTMENTAL REPORTS.

Year	National Revenue.	
1917	Shipping Report	.10 ✓
1927	Shipping Report	.25 ✓
	Public Works.	
1918	Georgian Bay Ship Canal, Vol 2.	.10 ✓
1917	Georgian Bay Ship Canal, Vol 1.	.10 ✓
	Railways and Canals.	
1917	Railways and Canals	.10 ✓
1929	Railways and Canals.	.25
	Dominion Statistician.	
1917	Canal Statistics	.10 ✓
1926	Canal Statistics	.25 ✓
	Total	\$3.55

Yours truly,

Russell C. Lohme

Received Jan 16/30

154238

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CENTS	55

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1930
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Department of Public Printing and Stationery

ALL COMMUNICATIONS
TO BE ADDRESSED TO THE
KING'S PRINTER, OTTAWA.
Ref.- Documents

OTTAWA, January 15th, 1930.

Dear Sir,-

With reference to your letter of the 7th inst., enclosing the sum of \$3.55, for which the documents enumerated in your correspondence have been forwarded with the exception of the Report of the Railways and Canals for 1929. The copy of this last publication will be forwarded to you as soon as it is released to the public.

Yours truly,

L. Normandin,
Chief, Division of Documents.

Russell C. Lohnes, Esq.,
316 Huntington Ave.,
Boston, Mass.,
U.S.A.

T.

Recd Jan 17/30

316 Huntington Ave.
Boston, Massachusetts
February 5, 1930

Ref.- Documents

Department of Public Printing and Stationery
Ottawa, Ontario

Gentlemen:

Mr. L. Normandin
Chief, Division of Documents

Your letter of the 15th January has been received,
and the documents have also arrived.

In explanation of my request for these publications
I wish to say that I am a student at Boston University,
matriculating for the degree of Master of Business Admin-
istration. For my degree thesis I have chosen the subject
"The Great Lakes - St. Lawrence Canal Project", and be-
lieve that the booklets you have sent me will be of great
assistance in the development of that subject.

As my thesis must be completed before the first of
April, the 1929 Report of the Railways and Canals would
not reach me in time to be of use. Will you, therefore,
kindly send me the 1928 Report instead. If there are any
monthly reports on the same subject, I should like to
have the ones which have been issued since the report for
1928, and will remit for whatever the cost of them may be.

If you have any outline maps of Canada on a fairly
large scale on which I could draft the plan of the proposed
canal, I should like to have them, and will also be glad
to pay for them if there is a charge.

Yours very truly,

Russell C. Lomies

P.S. Please send me the latest catalogue of public docu-
ments.



Department of Public Printing and Stationery

ALL COMMUNICATIONS

TO BE ADDRESSED TO THE
KING'S PRINTER, OTTAWA.

Ref. Documents.

OTTAWA, Feb. 8th., 1930.

Dear Sir,

I beg to acknowledge receipt of your letter of the 5th instant, and am forwarding you copy of the Report of the Department of Railways and Canals for the year 1928 to complete your order. I also wish to state that there are no other report published except the Annual Reports.

Your request for maps of Canada is being referred to the Department of the Interior for their attention.

Yours truly,

E.J. LaRoche,
Acting Chief, Div. of Documents.

Mr. Russell C. Lohnes,
316 Huntington Ave.,
Boston, Mass.

L.

Mr. Russell C. Lohnes,
316 Huntington Ave.,
Boston, Mass., U.S.

Ottawa, Jan. 9th, 1930.

Dr. To Department of Public Printing and Stationery, Ottawa, Canada
Doit au Département des Impressions et de la Papeterie Publiques, Ottawa, Canada

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1	" Canada Shipping Act		1 00
1	" Export Act		10
1	" Govt. Annuities Act		10
1	" Inland Water Freight Rates Act		10
1	" Maritime Freight Rates Act		10
1	" Naturalization Act		25
1	" Navigable Waters Protection Act		10
1	" Oaths of Allegiance Act		10
1	" Trust Companies Act		25
1	" Water Carriage of Goods Act		10
1	" Shipping Report 1917		10
1	" " " 1927		25
1	" Georgian Bay Ship Canal, Vol. 2, 1918		10
1	" Georgian Bay Ship Canal, Vol. 1, 1917		10
1	" Railways and Canals Report 1917		10
1	" Railways and Canals Report 1929		50
1	" Canal Statistics 1917		10
1	" Canal Statistics 1926		25
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	By cash Receipt No. 5718		<hr/>
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	Balance due		<hr/>
			25

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DÉPARTEMENT DES IMPRESSIONS ET DE LA PAPETERIE PUBLIQUES

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OFFICIAL RECEIPT

REÇU OFFICIEL

Ottawa, March 5th, 1930.
CANADA

Received from } Russell C. Lohnes, Esq., Boston, Mass.
çu de }

Twenty-Five Cents Dollars,

} Balance due for Various Copies of Publications.
ur }

D45354

F. G. BRONSKILL,
Chief Accountant.
Comptable en chef.

0.25

1400

9M

1400

9M

DEPARTMENT OF PUBLIC PRINTING AND STATIONERY
DÉPARTEMENT DES IMPRESSIONS ET DE LA PAPETERIE PUBLIQUES

N^o 5718

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REÇU OFFICIEL

Ottawa, Jan. 9th, 1930.
CANADA

Received from } Russell C. Lohnes, Esq., Boston, Mass.
çu de }

Three '55/100 Dollars,

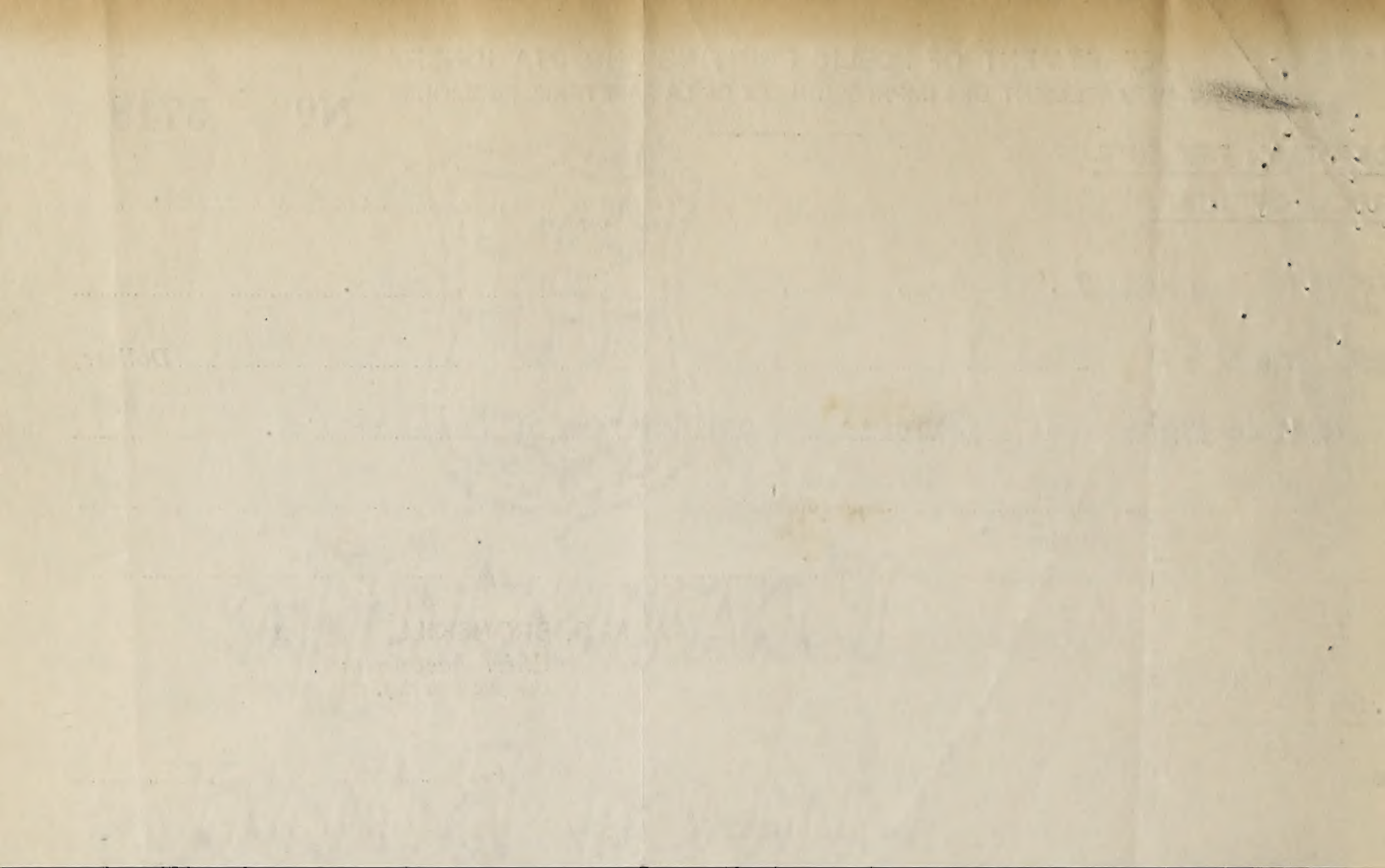
for } Various Copies of Publications per letter of January 7th.

F. G. BRONSKILL,
Chief Accountant.
Comptable en chef.

3.55

Per.....P.L.....

Bulletin of the Departments of History
and of Political and Economic Science
in Queen's University, Kingston, Ont.,
Canada.



316 Huntington Avenue,
Boston, Massachusetts,
January 7, 1930.

Queen's University
Kingston,
Ontario,
Canada.

Gentlemen:

Please send me the following book published
by your institution; for which you will find en-
closed a United States Postal Money Order, Num-
ber 154237, for the sum of Sixty cents. This
amount is to cover the cost of the book and the
postage necessary to forward it.

"Problem of the Upper St. Lawrence." by Mr. F. King; '29; pa.	\$0.50
Postage to forward the book	<u>.10</u>
Total of above	\$0.60

154237

RECEIPT

DOLLARS	60
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I am matriculating for the degree of Master
Business Administration at Boston University
have chosen for my degree thesis the subject
the proposed St. Lawrence project. The book
materially aid me in my research.

Yours truly,

Russell L. Palmer

Received Jan 11/30



Queen's Quarterly

KINGSTON ONT.

January 9th, 1930

Mr. Russell C. Löhnes
316 Huntington Avenue
Boston, Mass.

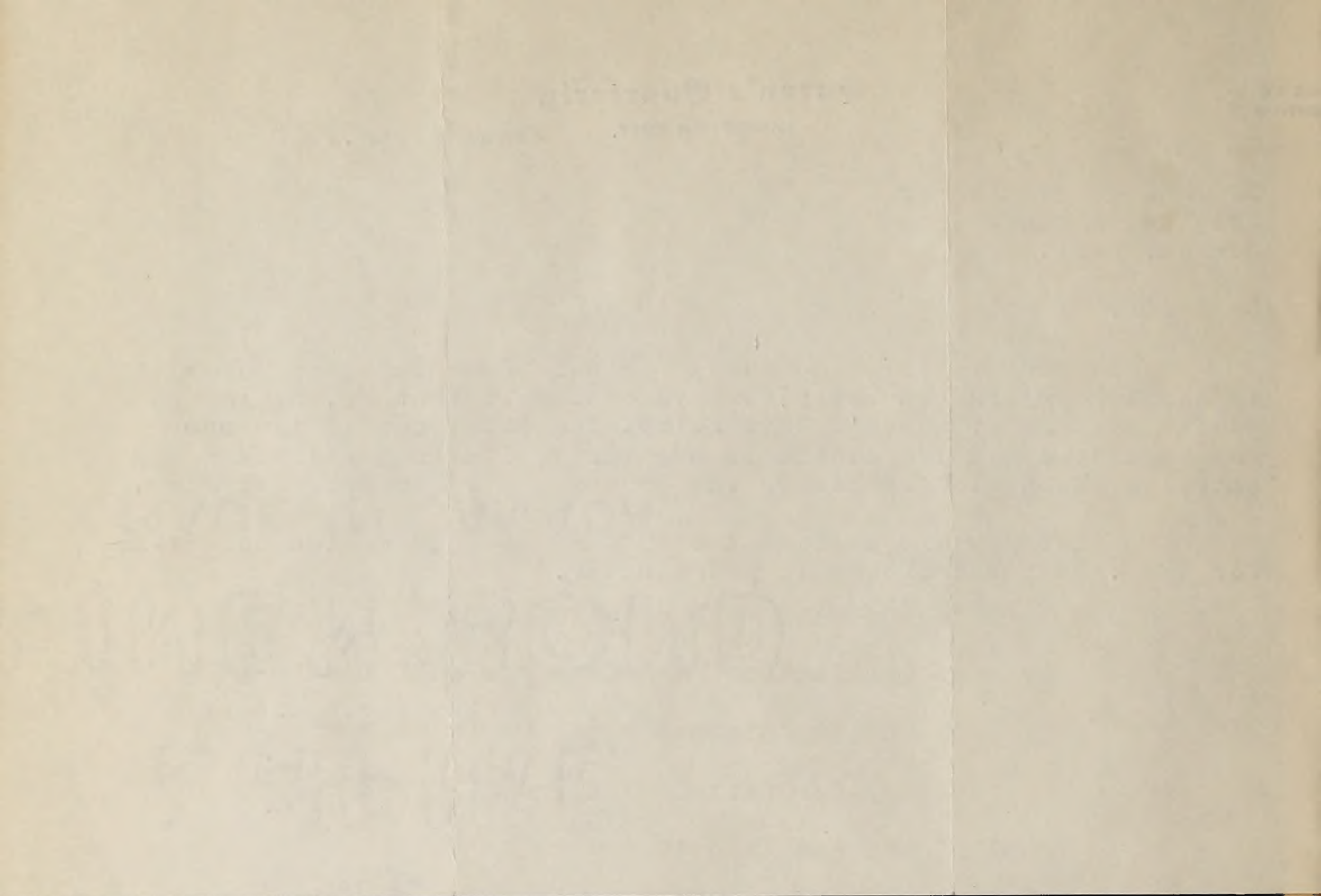
Dear Sir,

Your letter of January 7th has been handed to me and I am sending you in two separate envelopes Bulletins No. 57 and 58 published here at Queen's University. The first one is the one you requested and the second is our last Bulletin published entitled "Economic Aspects of the Proposed St. Lawrence Shipway".

As you are a student I am sending you the two bulletins for the .60¢ you enclosed in your letter.

Yours very truly,

Mary R. Anglin
Business Manager



316 Huntington Avenue,
Boston, Massachusetts,
January 7, 1930.

Brookings Institution,
26 Jackson Place,
Washington,
D. C.

Gentlemen:

Please send me the following book published
by your institution for which you will find en-
closed a United States Postal Money Order, Num-
ber 154236, for \$4.15. This sum is to cover the
cost of the book and the postage necessary to for-
ward it.

"St. Lawrence Navigation and Power Project,"
by H. C. Moulton and others. \$4.00

Postage .15

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I am matriculating for the degree of Master
Business Administration at Boston University
have chosen for my degree thesis the subject
"Great Lakes-St. Lawrence Canal Project." The
may aid me in my research.

Yours truly,

Russell L. Lobue

*Book received
Jan 13, 1930*

316 Huntington Avenue,
Boston, Massachusetts,
January 7, 1930.

Mr. S. S. Wyer,
Columbus,
Ohio.

Dear Sir:

In looking through the Industrial Art Index I noticed that there was listed under the caption of "St. Lawrence river." a book written by you entitled "Study of St. Lawrence Waterway Project," issued in 1928. It also indicated that the book was gratis, although I am willing to pay for it should such not be the case.

I am matriculating for my degree of Master of Business Administration at Boston University and have chosen for my degree thesis the subject dealing with the proposed St. Lawrence canal project. This book may materially aid me in my research.

Yours truly,

Russell L. Palmer

Received: January 20, 1930.

1. Study of St. Lawrence Waterway Project
2. Fundamentals of Transportation Problem
3. Study of Electric Light and Power Service
4. "Sir Allan Beck" Vattack on Smithsonian Institution's "Niagara Falls: Its Power Possibilities and Observation." Compared with facts.

Samuel S. Wyer
Consulting Engineer
Columbus, Ohio
October, 1927

ntel July, 1928
Sept. 1928

The following may be obtained free, singly or in quantities, for use of classes or teachers

FROM
FUEL-POWER-TRANSPORTATION EDUCATIONAL FOUNDATION
1116 BEGGS BUILDING
COLUMBUS, OHIO

1. **FUNDAMENTALS OF OUR FERTILIZER PROBLEM**—with introduction by Honorable W. M. Jardine, Secretary of Agriculture. 16 pages of concise information on the fertilizer problem in the United States and showing the relation of the Muscle Shoals project to this.
2. **PRIMER ON ECONOMICS**—23 pages of discussion of fundamentals set up in primer form so as to be easily used by pupils.
3. **STUDY OF ELECTRIC LIGHT AND POWER SERVICE**—with introduction by Charles F. Scott, Professor of Electrical Engineering, Yale University. 64 pages of simple, non-technical information showing beginnings of electricity, how coal is converted into electricity, how water power is harnessed, getting electricity to the home, utilization, economics, holding company problems, public interest and acceleration of growth.
4. **STUDY OF THE ST. LAWRENCE WATERWAY PROJECT**—32 pages. This, without conclusions or recommendations as to whether the project should or should not be built, gives the fundamental facts needed to enable citizens to come to their own conclusions as to what in the public interest ought to be done.
5. **FUNDAMENTALS OF TRANSPORTATION PROBLEM**—64 pages. Gives in primer form the public's vital interest in transportation, water-way fundamentals, Panama Canal experience, steam railroad situation, electric street car situation, motor vehicle and public highway situation, and regulation of transportation.
6. **NITROGEN CHARTS**. (Two 12" x 23") showing agricultural nitrogen situation in the United States, inorganic nitrogen situation in the world and in the United States.
7. **Chart—HOW NATURAL GAS IS FOUND; REDUCED TO POSSESSION, TRANSMITTED AND DELIVERED TO ULTIMATE CONSUMER** (8" x 24").
8. **Chart—CHART OF SMITHSONIAN INSTITUTION MODEL** of manufactured gas, how it is made and delivered to the home (11" x 32"). Shows both coal gas and water gas manufacture and how it is delivered to the home.
9. **FUNDAMENTALS OF SMOKE NUISANCE**—24 pages. Discusses what makes smoke nuisance, what it does to community, public's interest in and how to cope with the smoke nuisance. Includes chart 9" x 24" showing typical products derived from coal that are lost when bituminous coal is burned in the raw state.
10. **POWER POSSIBILITIES AT MUSCLE SHOALS**—23 pages of fundamental facts, without conclusions or recommendations, as to what ought to be done.
11. **FUNDAMENTALS OF OUR COAL PROBLEM**—40 pages. Gives digest of the United States Coal Commission findings and additional data needed to understand the problem.
12. **SHIFT OF CIVILIZATION CHART** (24" x 37") with accompanying 46-page descriptive manual. This shows the thought streams that are the origins of our today's machine civilization.

"Sir Adam Beck" attack on Smithsonian Institution's "Niagara Falls: Its Power Possibilities and Preservation" compared with facts.

Educational Foundation

*Hartman Building
Columbus, Ohio*

The Ohio Chamber of Commerce

316 Huntington Avenue,
Boston, Massachusetts,
January 9, 1930.

Fuel - Power - Transportation
Educational Foundation
1116 Beggs Building,
Columbus, Ohio

Gentlemen:

I am a graduate student at Boston University,
matriculating for the degree of Master of Business
Administration.

For my degree thesis I have chosen the subject
"The Great Lakes - St. Lawrence Canal Project," and
it is in the hope of obtaining information on this
subject that I am addressing you.

Please send me your pamphlet "Study of St. Law-
rence Waterway Project", and if you have any other
material that would aid me in my research I shall be
very glad to receive it.

I wish to thank you in advance for any service
that you may render in this respect.

Yours truly,

Russell L. Lohmes.

Recd: Jan 17/30

- 1. Study of St. Lawrence Waterway Project*
- 2. Transportation Problem*

FROM
FUEL-POWER-TRANSPORTATION EDUCATIONAL FOUNDATION
1116 BEGGS BUILDING
COLUMBUS, OHIO

for

Russell C. Lohmes
316 Huntington Avenue
Boston
Massachusetts

Hof

316 Huntington Avenue
Boston, Massachusetts
February 5, 1930

Fuel - Power - Transportation
Educational Foundation
1116 Beggs Building
Columbus, Ohio

Gentlemen:

On the 7th January I wrote to Mr. S. S. Wyer of Columbus asking for certain material entitled "Study of St. Lawrence Waterway Project." This book I have received from you together with various other pamphlets relating to the same subject, and I am greatly obliged to you for sending them to me. They will be of considerable assistance in the preparation of my thesis.

On the 9th January I wrote direct to you asking for similar material, not knowing that my other letter would come to your attention. The pamphlets sent in response to that letter have also been received, and I thank you for them.

Yours very truly,

Russell C. Lobner

FROM

UNIVERSITY EXTENSION DIVISION
THE UNIVERSITY OF WISCONSIN
MADISON, WISCONSIN

To. Mr. Russell C. Lohnes
316 Huntington Avenue
Boston, Massachusetts

316 Huntington Avenue,
Boston, Massachusetts,
January 9, 1930.

University of Wisconsin,
Madison,
Wisconsin.

Gentlemen:

Please send me a copy of the following bulletin
published by your institution some years ago:

"Wisconsin and the Great Lakes, St. Lawrence
Deep Water Route to the Sea." Serial Number
1136; General Series Number 919, 1921. (Price
15 cents).

You will find enclosed with this letter eight
two-cent stamps - a total of sixteen cents - to cover
the cost of the above mentioned pamphlet.

I am a graduate student at Boston University,
matriculating for the degree of Master of Business
Administration. For my degree thesis I have chosen the
subject "The Great Lakes - St. Lawrence Canal Project".

If you have any other material upon this subject,
I shall be glad to receive it and shall remit promptly
upon receipt of the publications should there be any
charge attached thereto.

I take this opportunity to express my gratitude for
any assistance that you may be able to give me.

Yours truly,

Russell C. Lohnes

*Received: Jan 25/30
See letter of that date*

THE UNIVERSITY OF WISCONSIN

UNIVERSITY EXTENSION DIVISION

MADISON

DEPARTMENT OF DEBATING AND PUBLIC DISCUSSION
OFFICE OF THE DIRECTOR

January 18, 1930

Mr. Russell C. Lohnes
316 Huntington Avenue
Boston, Massachusetts

My dear Mr. Lohnes:

Although we have a very limited supply of the bulletin "Wisconsin and the Great Lakes, St. Lawrence Deep Water Route to the Sea", we are sending you one copy. We note that you ask for other material. We have collected considerable material on this subject for loan purposes and would be very glad, indeed, to send you a regular loan package on the receipt of \$1.00. The package will include material for and against -- addresses, clippings, pamphlets, and other general information.

Very truly yours,

Almere L. Scott

Almere L. Scott, Director
Dept. Debating and Public Discussion

AS

LE



Please quote

File

D.L.B. Information

Department of the Interior 5461970

DOMINION LANDS ADMINISTRATION

10th January, 1930.

Sir:

In compliance with the request contained in your letter dated the 4th instant, I enclose herewith a copy of the latest Hand-Book in connection with Dominion Lands published for the information of the general public.

Your obedient servant,

Enc.1.

Commissioner of Dominion Lands.

Russell C. Lohnes, Esq.,
316 Huntington Avenue,
Boston,
Massachusetts,
U.S.A.



Department of the Interior
B.I.B. Information
DOMINION LANDS ADMINISTRATION

10th January, 1930.

Sir:

In compliance with the request
contained in your letter dated the 4th instant, I enclose
herewith a copy of the latest Hand-Book in connection with
Dominion Lands provided for the information of the general
public.

Very obedient servant,

Enc. 1.

Commissioner of Dominion Lands

Russell C. Johnson, Esq.,
316 Madison Avenue,
New York,
U.S.A.

316 Huntington Avenue
Boston, Massachusetts,
January 11, 1930.

Hon. C. E. Fleming, K. C.,
President, Canadian Deep Waterways and Power Assoc.
24 Chatham Street, West
Windsor, Ontario.

Sir:

The package of pamphlets, dealing with the St. Lawrence question, has arrived safely. Please accept my thanks for this valuable information. This material will enable me to develop in my degree thesis the Canadian point of view as well as that of the American side of the question.

As mentioned in my letter of the 2nd, instant, to you, I have chosen for my Master's degree thesis the St. Lawrence project. I submitted to the Director of the Graduate Division, Boston University, the subject title: "The Great Lakes - St. Lawrence Canal Project." But there is still some doubt in my mind as to the correctly legalized and official title by which the proposed project will be known, when it is completed.

I learn from the pamphlets that you sent to me that in Canada writers use such titles as the following:

St. Lawrence Deep Waterway
The Great Lakes - St. Lawrence Seaway
St. Lawrence Shipway
The St. Lawrence Seaway
St. Lawrence Waterway Project.

While here in the United States of America, the names by which the proposed project is known are even more numerous.

Hon. O. E. Fleming, K. C.; Jan. 11, 1930; page 2.

The following, for example, are some of the titles applied up to the present time:

- The St. Lawrence Ship Channel
- Great Lakes - St. Lawrence Seaway
- St. Lawrence Seaway
- The Great Lakes - St. Lawrence Waterway Project
- The St. Lawrence Waterway Project
- The St. Lawrence Seaway Project
- The St. Lawrence Navigation and Power Project
- The Great Lakes - St. Lawrence Deeper Waterway
- The Great Lakes and St. Lawrence River an International Highway to the Sea.

Now the question in my mind is: what one of the above names will be officially designated to this inland route from the head of Lake Superior to the Atlantic Ocean?

I shall be greatly obliged if you will enlighten me and state whether or not my title is appropriate, or an infringement upon some other writer's work.

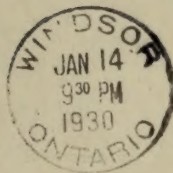
Yours very truly,

Russell C. Holmes



RETURN TO

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Barristers & Solicitors
WINDSOR, ONTARIO



Mr. Russell C. Lohnes,

316 Huntington Avenue,

Boston, Massachusetts.

Handwritten signature/initials



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Canadian Deep Waterways & Power Association

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Secretary

ERNEST ZERON, *Barrister*, WINDSOR

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January 14, 1930.

Mr. Russell C. Lohnes,
316 Huntington Avenue,
Boston, Massachusetts,

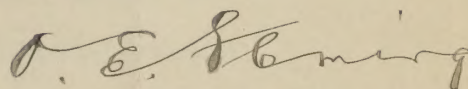
Dear Sir:

In reply to your letter of the 11th inst. I think that you have struck the right title for your thesis. The titles that have been used from time to time by our Association and the Great Lakes St. Lawrence Tidewater Association are ones that have appealed to us at the particular time as catchy, in that they would arrest the eye and the attention of the reader, not that it meant anything particular.

I think your proposed title is very appropriate and there is no doubt about your being entitled to use it.

I shall be delighted to receive a copy of your thesis when it is out.

Sincerely yours,



PRESIDENT.

OEF/c.

271 Newbury Street
Boston, Massachusetts,
January 11, 1930.

Executive Director
Great Lakes - St. Lawrence Tidewater Association
Munsey Building
Washington, D. C.

Dear Sir:

Since receiving the various publication from your Association dealing with the St. Lawrence development question, and more recently those from the Canadian Deep Waterway and Power Association, I have been somewhat perplexed as to the official title of the project when completed.

I learn from the pamphlets, which the Canadian Deep Waterways and Power Association sent to me, that in Canada writers use such titles as the following:

St. Lawrence Deep Waterway
The Great Lakes - St. Lawrence Seaway
St. Lawrence Shipway
The St. Lawrence Seaway
St. Lawrence Waterway Project

While herein in the United States of America, the names by which the proposed project is known are even more numerous. The following, for example, are some of the titles applied up to the present time:

The St. Lawrence Ship Channel
Great Lakes - St. Lawrence Seaway
St. Lawrence Seaway
The Great Lakes - St. Lawrence Waterway Project
The St. Lawrence Waterway Project
The St. Lawrence Seaway Project
The St. Lawrence Navigation and Power Project
The Great Lakes - St. Lawrence Deeper Waterway
The Great Lakes and St. Lawrence River
an International Highway to the Sea.

316 Huntington Avenue

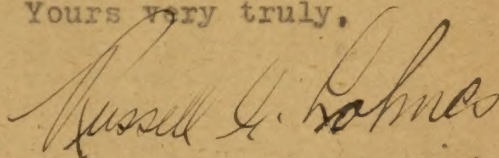
Executive Director; January 11, 1930; page 2.

As mentioned in my letter of December 14, 1930, to your Association, I have chosen for my Master's degree thesis the St. Lawrence project question. I submitted to the Director of the Graduate Division, Boston University, the subject title: "The Great Lakes - St. Lawrence Canal Project." But there is still some doubt in my mind as to the correctly legalized and official title by which the proposed project will be known, when it is completed.

Now the question in my mind is: what one of the above names will be officially designated to this inland water route from the head of Lake Superior to the Atlantic Ocean?

I shall be greatly obliged if you will enlighten me concerning the national or international name, if you please, by which this waterway will be known in the future. And also state whether or not my title is appropriate for the subject, or if it is an infringement upon some other writer's work.

Yours very truly,

A handwritten signature in cursive script, reading "Russell C. Lohnes". The signature is written in dark ink and is positioned above the printed name.

Russell C. Lohnes

GREAT LAKES-ST. LAWRENCE TIDEWATER ASSOCIATION

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WASHINGTON, D. C.

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January 14th, 1930

Mr. Russell C. Lohnes,
271 Newbury St.,
Boston, Mass.

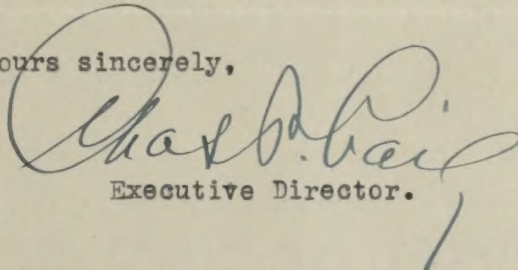
My dear Mr. Lohnes:

Yours of 11th inst. just received.

I hasten to advise you that the title you submitted for the subject of your master's thesis is perhaps about as unfortunate as any of those you enumerate for the very obvious reason that you designate it as a canal whereas not 5% of the 2300 miles from the head of Lake Superior to the sea, is canal.

There is no official name adopted by either country. In Canada it is generally designated as the St. Lawrence Waterway or St. Lawrence Waterway Project. In this country we have chosen as a more distinguishing and expressive title, the word seaway or ship channel, and we prefix the Great Lakes. I repeat that whilst in Canada it is almost universally designated as the St. Lawrence Waterway Project, so far as this Association is concerned we call it the Great Lakes-St. Lawrence Seaway or the Great Lakes-St. Lawrence Ship Channel Project - sub title - International Highway to the Sea.

Yours sincerely,



Executive Director.

C.

316 Huntington Avenue
Boston, Massachusetts
January 15, 1930

Montreal Board of Trade
Montreal, Canada

Gentlemen:

From an article in the Boston Transcript I learn that two Montreal engineers, Mr. Henry Holgate and Mr. J. M. Jamieson, have made a report of their investigation into the St. Lawrence Canal project. I would very much like to have a copy of their report, and hope you will be able to send it to me by return mail. If there is any expense in connection with the publication, I shall be glad to pay it on receipt.

In explanation of my request I wish to say that I am matriculating at Boston University, College of Business Administration, for the degree of Master of Business Administration, and have chosen for my degree thesis the subject "The Great Lakes - St. Lawrence Canal Project". I am sure that the report above-mentioned will be of very great interest to me in developing the work.

Yours very truly,

Russell C. Holmes

Received: January 20, 1930



THE MONTREAL BOARD OF TRADE

MONTREAL, December 30, 1929

Dear Sir,

For some years the Council of the Board of Trade has been giving a great deal of study to the proposed St. Lawrence Deep Waterways Project.

During the present year Messrs. Henry Holgate and J. A. Jamieson were retained by the Board to make a report on the economic aspects of the proposed deep waterways both from a navigation and power viewpoint. This report has now been received.

The Council is not prepared at the moment to express an opinion either on the conclusions reached or recommendations made; nevertheless it regards the report as an important contribution to the information available on the subject, and as such is circulating it to the members of the Board and others who may be interested.

Members are invited to communicate their comments, opinions or suggestions on the accompanying report, or on the project itself, for consideration by the Council. For those wishing further information the Board has available in its library a number of reports and other publications on the subject of the waterway.

Yours truly,

J. STANLEY COOK

Secretary.

316 Huntington Ave.
Boston, Mass.
February 5, 1930

Montreal Board of Trade

Montreal, Canada

Gentlemen:

The report which you kindly sent me in response to the request contained in my letter of the 15th January has been received, and I thank you very much for your promptness in forwarding it.

I am sure that the report will be of considerable help to me in preparing my subject.

Yours very truly,

Russell C. Lobbes

316 Huntington Avenue,
Boston, Massachusetts,
January 20, 1930.

Superintendent of Documents
Government Printing Office
Washington, D.C.

Sir:

The enclosed United States Postal Money Order for \$0.70 to cover the cost of the following official publications:

Article entitled "Great Lakes to the Sea," by Joseph A. Conry. (In Cong. Record of April 18, 1929, vol. 71, No. 4, 132 - 4.) \$0.09 ✓

Diplomatic correspondence between United States and Canadian Governments relative to the proposed Great Lakes-St. Lawrence waterway, etc. (In Cong. Record of April 27, 1928, vol. 69, No. 111, pp. 7630-7) .06 ✓

Extension of remarks in House, Apr. 17, 1928, by Representative Selvig, on "St. Lawrence Seaway," discussing its advantages to agriculture and commerce and favoring treaty negotiations with Canada. (In Cong. Record, vol. 69, No. 102, pp. 6935-43.) .14 ✓

of Edward W. Carrington, in the negative, to voting, on the debate, "Resolved, that the waterway connecting Great Lakes with Atlantic shall be by the St. Lawrence River rather than New York State route and Hudson River," and "New York State barge canal," from Encyclopedia Americana. (In Cong. Record of April 27, 1928, No. 111, pp. 7661-7.) .06 ✓

Water Transportation in United States. 1923. Maps. (Commerce Miscellaneous Series 119) 5 : 119 .15 ✓

works relating to deep waterways from Great Atlantic Ocean, with other related works. L C 2. 2 : W 31 .10 ✓

Navigation Bureau, Annual Report 1917 C 11. 1 : .05 ✓

Navigation Bureau, Annual Report 1928 C 11. 1 : .05 ✓

Total of Above \$0.70

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Delay in filling orders is often caused by the stock of publications requested having become temporarily exhausted.

Should you find it necessary, however, to make inquiry regarding this order, *be sure to refer to the number* on the label under which this shipment is sent to you. An acknowledgment card which also shows the order index number is sent out where it is apparent there will be delay in the filling of the order.

SUPERINTENDENT OF DOCUMENTS.

The number referred to above is the INDEX NUMBER to your order and must be referred to in ALL correspondence concerning the order.

Superintendent of Documents; page 2.

January 20, 1930

At present I am matriculating at Boston University for my degree of Master of Business Administration. I chose for my degree thesis the subject of the "St. Lawrence Waterway," hence my reason for requesting the publications listed in this letter.

If you have a catalogue listing publications of a more recent date than those which I have indicated above, I shall appreciate very much your sending me a copy.

I have been thinking that it might be appropriate for me to include a number of maps of the territory through which the route runs, in addition to the written material of the thesis. Is it possible to obtain such maps from the government service with their authority or consent to publish them with the written work in case I should desire to copyright it? I shall be very grateful if you will tell me whether or not such a thing is possible, and, if so, where I could obtain the maps.

Yours very truly,

Russell C. Lohnes

Enclosure:

UNITED STATES GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON, D. C.

OFFICIAL BUSINESS

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316 Huntington Ave.,
Boston, Mass.

mr

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10-1837

316 Huntington Avenue,
Boston, Massachusetts,
January 25, 1930.

Director,
Dept. Debating and Public Discussion,
The University of Wisconsin,
Madison, Wisconsin.

Dear Sir:

Enclosed with this letter is a United States Postal Money Order, Number 157379, for one dollar which is submitted as a charge for your regular loan package of material dealing with the Great Lakes - St. Lawrence Waterway Project question. This is submitted in compliance with your regulations as specified in your letter to me on the 18th of this month.

The pamphlet "Wisconsin and the Great Lakes - St. Lawrence Deep Water Route to the Sea" came to me in this morning's mail. I thank you very much for it.

Yours truly,

Russell C. Johnson

157379

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Received: Feb 3/30
Returned: Feb 15/30

375

329.

We mailed you today..... 60 pamphlets - 6 clippings
 (mounted) = 12 clippings in envelope - 1 mag - 1 Broch
 on : Great Lakes - Lawrence Waterway Project.
 which may be retained until 2-14-30.

We are crowded with requests for loans and must ask our friends to return material promptly. Upon request, loans will be renewed.

Kindly enclose your name and address with material returned.

UNIVERSITY EXTENSION DIVISION

Department of Debating and Public Discussion



FROM

UNIVERSITY EXTENSION DIVISION
 THE UNIVERSITY OF WISCONSIN
 MADISON, WISCONSIN

To.....

Russell C. Lohner.

316 Huntington Ave

Boston, Massachusetts

Received Feb 3/30

316 Huntington Avenue,
Boston, Mass.,
March 3, 1930.

Department of Public Printing and Stationery
Ottawa,
Ontario.

Gentlemen:

The enclosed United States Postal Money Order,
Number 164104, for Twenty-five cents (\$0.25) is for-
warded to your office in payment of the balance due
upon your Invoice Number D 45324, dated the 9th of
January, 1930.

Yours truly,

Russell C. Holmes

164104
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ISSUING OFFICE
MAR 14 1930
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316 Huntington Avenue,
Boston, Massachusetts,
March 10, 1930.

King's Printer,
Dept. of Public Printing and Stationery,
Ottawa,
Ontario.

Gentlemen:

Please send me the publication indicated here-
under for which you will find enclosed a United States
Postal Money Order, Number 165158;

ST. LAWRENCE SHIP CHANNEL. Tide Tables and In-
formation connected with the ship channel between
Montreal and Father point, and with the port of Mont-
real; Montreal to Lake Ontario; Ottawa river; and
Bay of Quinte.....Price.....\$0.25

165158

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ISSUING OFFICE

STAMP HERE

Yours truly,

Russell C. Lohnes
Russell C. Lohnes.



Department of Public Printing and Stationery

ALL COMMUNICATIONS
TO BE ADDRESSED TO THE
KING'S PRINTER, OTTAWA

OTTAWA, March., 13th., 1930.

Your communication of the 10th inst...
requesting 1 ~~copy~~ copy of the
publication entitled Tide Tables re St.L. Ship Channel
and enclosing \$0.25c in payment has been
received. This document is not yet available
for distribution and your request has been
placed on our waiting file. As soon as copies
are available, the order will be filled. Our
present expectation is that the distribution may
be made by about a month.

Yours truly,
Mr. Russell C. Lohnes,
316 Huntington Ave.,
Boston, Mass.

L. NORMANDIN,
Chief Clerk of Distribution

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WASHINGTON, D.C.

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N^o 10115

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REÇU OFFICIEL

Ottawa,.....Mar. 12, 1930.
CANADA

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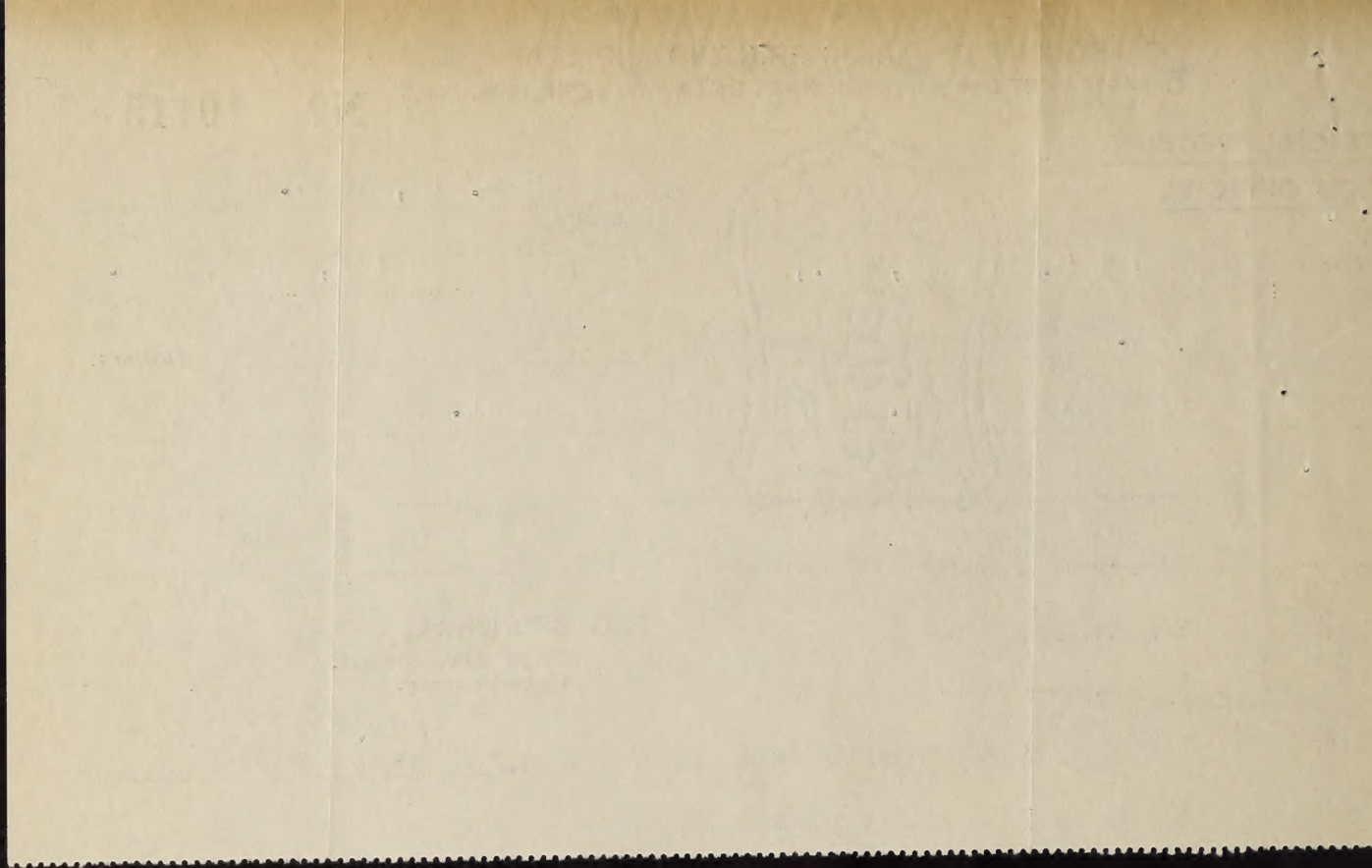
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Russell Le. Lobine

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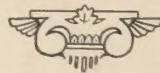
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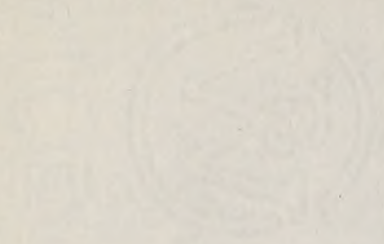
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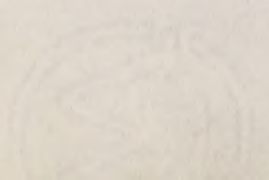
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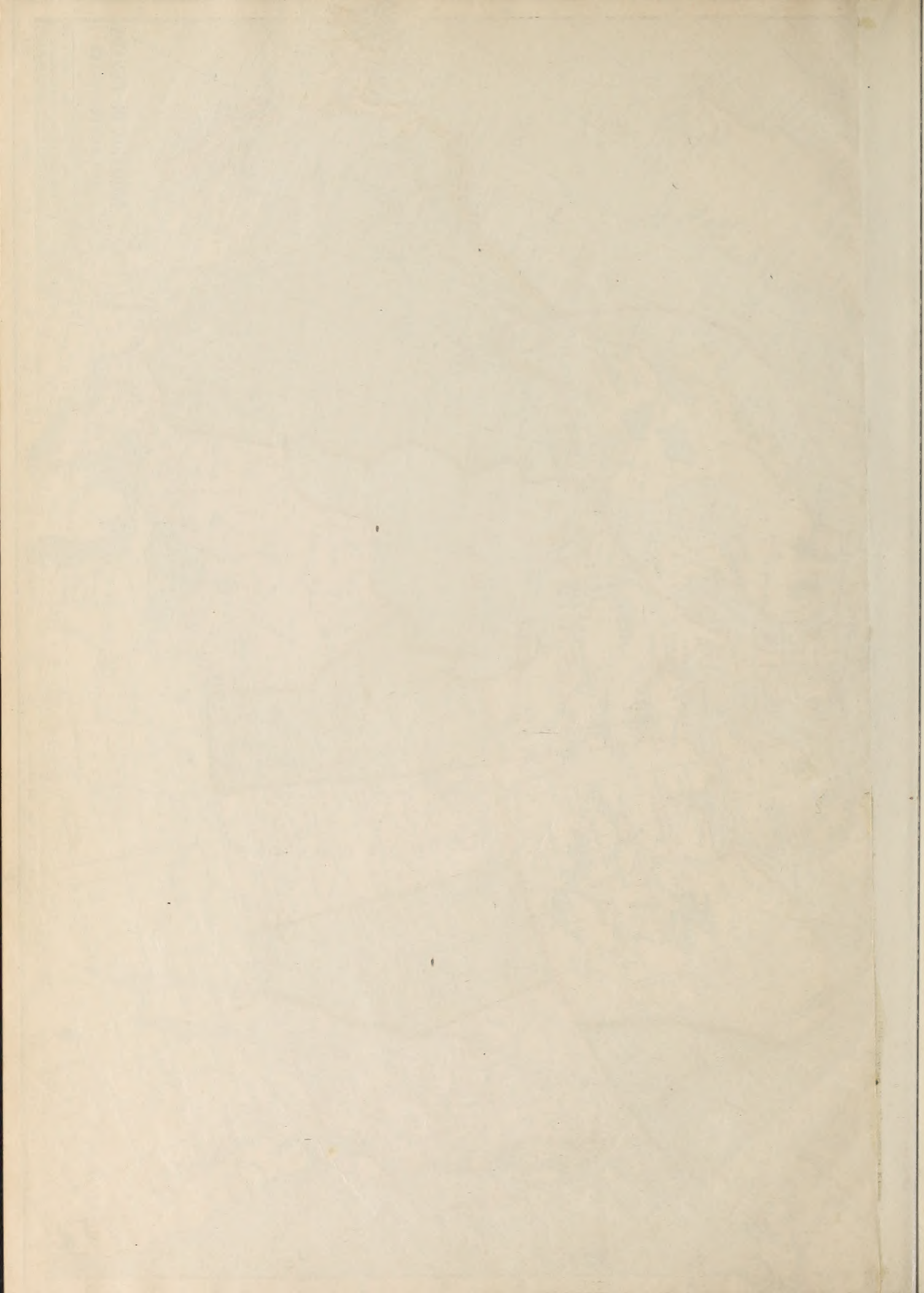
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SCALE OF MILES
0 100 200 300 400
Capitals of Countries Capitals of Divisions
Size of Type indicates relative importance of places

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Thesis

THE GREAT LAKES - ST. LAWRENCE WATERWAY

An International Highway to the Sea

Submitted by

RUSSELL COTTMAN LOHNES

B. B. A., Boston University, 1929

In partial fulfillment of
the requirements for the degree of
Master of Business Administration.

1931

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An International Highway to the Sea

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THE GREAT LAKES - ST. LAWRENCE WATERWAY

An International Highway to the Sea

CHAPTER I

DISCOVERY, EXPLORATION, AND EARLY CONQUEST

In ancient times many were the traditions passed down through centuries of the existence of a western world. The Greek and Latin writers alluded in their works to the Gardens of the Hesperides and the Island of Atlantis, which undoubtedly had reference at the time to the great continent lying to the west and, after its discovery, known as America. Other Mediterranean adventurous navigators - Carthagenians and Phoenicians - are supposed, according to legendary stories, to have discovered an hitherto unknown land beyond the western sea while voyaging by way of the Azores.

Little credence can be given to stories of a similar nature concerning the venturesome Welsh and Irish mariners, although Dawson writes in his book "The St. Lawrence Basin" that the legend of St. Brandan is very ancient and is of Celtic origin. His writings further indicate that St. Malo of Brittany, known in Normandy as St. Maelon, whose church in Rouen is one of that city's chief ornaments, accompanied St. Brandan on his

voyage to the island of the Saints; that the island¹ was placed far to the south by Martin Behaim, a native of Germany, but it was usually supposed to lie west of Ireland; and that the date of the voyage was given by him as A.D. 565; it can be found on maps dating as late as 1775.²

But the claims of the Norsemen concerning the discovery of America apparently rest upon a more substantial foundation, for the sagas record that Leif Ericson in the year one thousand wintered in a newly-discovered land far to the west of his native country and so burdened with an abundance of wild grapes that he gave it the name of Vinland. It is thought that from the latitude recorded it would be in the vicinity of Boston. Yet before this alleged discovery the Norsemen had, about the year A.D. 874, colonized Iceland lying some eight hundred and fifty miles distant from

1. The island of St. Brandan and of Brazil. Cf. Dawson, op. cit., p. 9: "The imaginary island of O'-Brazil may be found in Jeffrey's American Atlas (published in 1776) west of Cape Clear in long. 17°35'W.," and H. P. Biggar, "The Voyages of Jacques Cartier," 1924, p.303, note 2: "St. Brandan's island which figured on medieval maps. Cf. C. Raymond Beazley, 'The Dawn of Modern Geography,' 230-239, London, 1897; and P. Gaffarel, 'Historie de la découverte de l'Amerique,' I, 205-209, Paris, 1892."

2. S. E. Dawson, "The St. Lawrence Basin," London, 1905, pp. 9 - 10.

Norway. And from Icelandic sagas further evidence is expounded that Greenland was discovered shortly thereafter and settled¹ and that for four hundred years it remained a See of Rome, with a succession of seventeen Christian bishops.² The sagas further record how Ericsson visited and gave to Nova Scotia the name of Markland and to Newfoundland that of Helluland, and that some colonies were settled in Vinland, but records of their attempt to build a colony at Vinland are somewhat vague³ so that quite evidently they were killed by natives or died from disease and hunger.

Then the great American continent - that land rich in nearly every potential resource needed by civilized man, and destined to nourish and support a civilization more populous than that of any European country of the Norsemen's day and more wealthy than any then on earth - resumed its sleep of obscurity for five centuries or

1. Eric the Red, a famous sea rover, voyaged to Greenland; in 985 he made a second trip, carrying with him a large group of emigrants. This colony, with Gardar as its capital city, was in reality the first European settlement in North America. Vid. N. W. Stephenson, "An American History," 1913, p. 5.

2. R. B. Anderson, "America Not Discovered by Columbus," Ch. 7.

3. Cf. Stephenson, op. cit., p. 6: "We have record of at least one man who was born there, a certain Snorre, from whom many persons of later years claimed decent."

more¹ until Columbus² heralded to the nations of Europe in 1492 his discovery of what he then thought was the mainland of the New World. Historians³ report that he sailed southward some twelve hundred miles past the Isthmus of Panama hoping to find a shorter way to India - the land of coveted treasures - other than

1. It is also of doubtful authenticity that the voyage of Skalko by command of the King of Denmark in 1476 to the coast of Labrador was actually consummated.

2. Christopher Columbus, a Genoese mariner, intent upon the discovery of a new road leading to India and China by sailing a direct westerly course, received a commission from his sovereign mistress, Isabella of Castile. With three small vessels, the Pinta, Nina, and the Santa Marie, Columbus, after solemnly partaking of religious rites, set sail on Friday, August 3, 1492. For thirty-five days, after leaving the Canary Islands on 6th September, they sailed a westerly course. At two o'clock in the morning of October 12th lights were seen in the darkness, the watch aloft shouted a warning of "Breakers ahead!" They had made a landfall, and the cry of "Land!" joyously sped from ship to ship. The sighted land was one of the Bahamas group, and, to commemorate their safe deliverance, was reverently named San Salvador. A short cruise among the neighbouring islands, and then he returned to Spain to proclaim his find in the name of his sovereign. High honours were bestowed upon him, and at his disposal were placed the naval resources of the country. He was so eager to pursue his exploration of the newly-discovered lands that he quickly set sail again (1493) with seventeen ships and fifteen hundred men. After several subsequent voyages (1498 and 1506), misfortune befell him through malicious representations; he was deprived of his commission, sent back in chains to Spain where he died on May 20th, 1506, at Seville. In 1536 his remains were conveyed to Santo Domingo, from which place they were removed to the cathedral at Havana in 1706 with much ceremonious pomp.

3. J. S. Bassett, "A Short History of the United States," p. 30.

the tedious caravan route through the Syrian deserts; and did not explore the mainland coast lying not far westward from the Bahama islands.

From Cabot to Cartier

Thus Continental America was not first discovered by Columbus, but by John Cabot, who, like his contemporary - Columbus - was an Italian¹ and a native of Genoa. Upon petition from John Cabot King Henry VII of England granted a commission², bearing the date of March 5, 1496, to him and his three sons, - Sebastian, Santo and Lewis, - to search for western lands, and, if possible, endeavour to find a North-West passage leading to India and China (Cathay); however, he did not set sail³ until May 2, 1497. They landed, June 24, on the coast of Labrador, or possibly Newfoundland, or Cape Breton; and to this land gave the name of Prima Vista. Possession of the land was taken

1. Bassett, op. cit., p. 35: "But a naturalized citizen of Venice."

2. Cf. Dawson, op. cit., p. 16: "Letters patent were granted, dated March 5th, 1496, and were made out to John Cabot and his sons alone. The letters gave 'full and free authority, &c., of navigation to all parts, countries and seas of the east, west, and north, under our banners, flags, and ensigns,' " And Ibid., loc. cit., "The King did not authorise any discovery to the south; for there the Spaniards were in occupation."

3. In a small vessel, the Matthew, the crew of which comprised only eighteen men.

in his sovereign's name, the English flag planted by power conferred to him under letters patent, and his Venetian flag of St. Mark unauthoritatively displayed. No natives were seen but only evident traces of their presence, such as snares for catching game and needles for making nets¹ were found by Cabot. Little time did he spend in cruising for early August found him back in Bristol. He was thus the first discoverer² of the continent of North America, fourteen months before Christopher Columbus, in his third voyage, beheld the mainland.

A second voyage³ was made in May, 1498. This time he followed the coast of America southward as far as what is now known as Cape Hatteras from whence he returned to England in late autumn. Records do not reveal whatever became of him in later years.

1. Dawson, op. cit., p. 22.

2. Cf. Dawson, op. cit., p. 45: "... But John Cabot is the real discoverer.....Whatever claims of priority England possesses on the American continent she owes to John Cabot."

In recognition of his great achievement, the king granted him a bonus of ten pounds, and later twenty pounds a year.

3. C. G. D. Roberts, "A History of Canada," p. 7. Sometimes ascribed to his son Sebastian, who, it is said, sailed with two vessels in 1498 in an endeavour to reach the Indies by a north-west route. He sailed as far north as Hudson's Straits, where Arctic ice forced him to abandon the undertaking.

By 1500 a Portuguese navigator, Gasper Cortereal, had also cruised from Cape Race on Newfoundland as far north as land¹ which he named Terra Verda. In 1500, he sailed a second time from Lisbon for America, but failed to return; his brother, Micheal, who in 1502 ventured in search² for him, also disappeared.

Juan Verrazano (Giovanni da Verrazano)³, of Florentine citizenship, was the next important visitor to the American shores. He was commissioned by the French king, Francis I, to explore⁴ the coast of the New World and locate a short route to India and China by the Northwest. He was not successful and returned shortly thereafter, but received a cool reception in view of his failure to bring back with him valuable merchandise, gold, and other things of interest.

The exact accomplishments of his voyage are difficult to determine from his narrative; but most writers believe that he penetrated the Hudson river and then

1. Possibly Greenland.

2. Wm. White, "The Annals of Canada," published in the Canadian monthly, 1875 and thereafter, p. 1.

3. Spelled Verrazzani by some writers.

4. Leaving "Islas desiertas," on January 17th, 1524, he made a landfall in 34° N. latitude, from whence he coasted northward unto the Gulf of St. Lawrence; taking departure from Newfoundland he returned to France. See in The New Larned History, 1922, Vol. I., p. 271.

explored Narragansett Bay while on a cruise eastward along the coast; later continuing¹ in an easterly direction along the coast of Maine, Nova Scotia and Cape Breton, striking from here across and following the southern shores of Newfoundland to Cape Race, then turning northward along the east coast of Newfoundland to 50° N. latitude from which latitude he headed eastward toward France, where he arrived on July 8, 1524.

For the next decade French explorations of the northern coast of America were at a standstill. At the end of that time tidings concerning the colonizing and exploring activities of the Spaniards² in the south part of North America once more aroused the French interest in the New World, and another skilled and experienced navigator³ was chosen to find the opening to Cathay and continue the discoveries of his predecessor - Verrazano.

1. Dawson, op. cit., p. 93.

2. Bassett, op. cit., p. 38: "In 1527 (de Narvaez) sailed from Spain for Florida with a colony of six hundred persons..Desertion and shipwreck reduced these to four hundred.....Finally, four men, all who were left of the six hundred.....reached the city of Mexico..... One of them was Cabeza de Vaca, historian of the expedition..." And Ibid, loc. cit.: "Hernando de Soto was made governor of Cuba and ruler of Florida which he was to explore and colonize at his own expense. May 30, 1539, he landed at Tampa Bay with 620 men."

3. Jacques Cartier.

Jacques Cartier Discovers the St. Lawrence

Philip Chabot, Admiral of France, persuaded the French king, Francis I, that he give Jacques Cartier permission to attempt a journey to the North American continent in an effort to further explore the new region. After preparations for the long passage had been fully completed, he set sail¹ on April 20, 1534, for Newfoundland where he arrived in May. Running south-south-west for six degrees, he entered a port which he named St. Catherine; from there he turned and cruised northward along the Newfoundland coast until he reached the bay of Castles² on May 27th.

1. Cf. H.P. Biggar, "The Voyages of Jacques Cartier," 1924, p. 3: "When Sir Charles de Mouy, Knight, Lord of La Meilleraie and Vice-Admiral of France, had received the oaths of the captains, masters and sailors of the vessels, and had made them swear to conduct themselves well and loyally in the King's (Francis I.) service, under the command of the said Cartier, we set forth from the harbour and port of St. Malo with two ships of about sixty tons' burden each, manned in all with sixty-one men, on (Monday) April 20, in the said year 1534; and sailing on with fair weather we reached Newfoundland on (Sunday) May 10, sighting land at Cape Bonavista in latitude 48° 30' and in degrees of longitude. And on account of the large number of blocks of ice along that coast we deemed it advisable to go into a harbour called St. Catherine's harbour, lying about five leagues south-south-west of the Cape (Bonavista), where we remained the space of ten days, (May 11 to 21), biding favourable weather and rigging and fitting up our long boats."

2. Cf. Biggar, op. cit., p. 9 - 10: "On Wednesday the twenty-seventh of the month (of May) we reached

When he weighed anchor and resumed his northward journey, he little anticipated that to him would fall the distinction of realizing other great navigators' beliefs. Sebastian Cabot seemed to have suspected the existence of an opening somewhere in the region of Bacalloas (Newfoundland), and Stephen Gormez certainly did according to his voyage reports. That suspicion, though, it was the task of Jacques Cartier to justify, and although he did not find a passage to the Great South Sea, he found an avenue into the very heart of the continent through the most wonderful system of waterways in the world.

Little did he (Jacques Cartier) realize, when, on that eventful summer day in June, he steered his small but staunch and seaworthy vessels through that narrow strait - the Strait of Belle Isle - which separates the shore of the island of Newfoundland from the bleak, barren and desolate coast of Labrador on the mainland, and sailed out upon a great expanse of clear blue sea, that he was cruising upon what would after the elapse of a

the mouth of the bay of Castles, but on account of the unfavourable weather and of the large number of icebergs we met with, we deemed it advisable to enter a harbour in the neighborhood of that entrance called Karpont, where we remained, without being able to leave until (Thursday) June 9, when we set forth in

few centuries become a great international highway over whose route would eventually flow a volume of commercial traffic unimagined and surpassing in greatness that of any inland waterway of our present civilization. Nevertheless, at the time he was entirely ignorant of the importance and magnitude of his discovery, partly because his attention was distracted by other lands lying nearby, and partly to stormy weather.

Voyaging southward along the northwestern coast of Newfoundland and steering in a more westerly direction, he reached¹ a large bay which he named Baie de Chaleur. Landing at the rocky headland of Gaspé, he set up a cross, left the lily shield of France, and took possession of the country in the name of his sovereign, Francis I. Taking with him two of the natives, from whom he learned of the existence of a great river leading far into the interior of the continent, he sailed up the Gulf of St. Lawrence till he could see the land on either side. He then returned² to France where

order with God's help to proceed farther on. Karpont lies in latitude 51° 30'."

1. Cf. Biggar, op. cit., p. 45 et seq.: "...The third day of July,... we had hopes of discovering here a strait like the one at the Strait of Castles..(Strait of Belle Isle)... The middle of this bay lies in latitude 47° 30' and in longitude 73°." And Ibid., p. 47, note 17: "... The latitude of Chaleur bay is about 48° 10'."

2. Biggar, op. cit., p. 79: They left the harbor

he arrived on September 5, 1534. His report of the discovery caused much enthusiasm at the French court.

The king was favourably impressed, and commanded that three vessels¹ better equipped than the first be furnished for the second enterprise. Thus, on May 19, 1535, did Jacques Cartier again sail for the vast unexplored continent of America. By September 7, of the same year, he had reached the Island of Orleans², named by him the Isle of Bacchus.

Notwithstanding the refusal of the Indians of Stadacona, especially Taignoagny and Domagaya, to aid in the expedition to Hochelaga, Cartier determined to attempt the trip unaided. Leaving two vessels anchored at the mouth of the Ste. Croix³, he pressed on with the Hemerillon until the shallow waters of Lake St.

of Blanc Sablon (Newfoundland), after mass was given, on Saturday August 15, 1534, and arrived at St. Malo Saturday September 5 of the same year.

1. Biggar, op. cit., pp. 93-94: Cartier's fleet consisted of the Grand Hermyne, 126 tons burden, commanded by Cartier with Thomas Fromont as his mate, and Claud de Pontbriant as cup-bearer to His Highness the Dauplin; the Petite Hermyne, of 60 tons, commanded by Mace Jalobert, whose mate was Guillaume Le Marye; and the Hemerillon, 40 tons burden, captained by Guillaume le Breton.

2. Cf. Biggar, op. cit., p. 120: "On (Thursday) the seventh of the month (September), after we had cast anchor between this large island and the north shore, we went on land and took with us the two Indians we had seized on our former voyage."

3. The St. Charles river. Vid. Biggar, p. 126.

Peter were encountered, from whence he proceeded in long-boats, and on October 2nd, reached the Indian town of Hochelaga. The following day he climbed the mountain lying back of the town and gave it the name of Mont Royal (now Mount Royal). Here he viewed the flashing waters of the Lachine Rapids, and the Ottawa River, which the Indians told him led to the province of Saguenay, where men¹ lived who were similar in appearance to the French. He was back at Stadacona on the banks of the St. Croix river by the eleventh of October. A strong fort had been constructed during his absence. It now being late in the season he decided to winter at Stadacona (now Quebec). On May 6, 1536, he set sail for St. Malo, where he arrived June 16, carrying with him Donnacona and four other chiefs. These never again saw their native land, all of them dying² before another expedition returned.

The religious wars with Charles V. now for four years absorbed the attention and exhausted the treasury of Francis I. At length, in 1540, Francois de la Rogue, Seigneur de Roberval, obtained an appointment³

1. Evidently the English at Hudson Bay.

2. C.G.D. Roberts, "A History of Canada," p. 14.

3. Wm. White, "The Annals of Canada," p. 2.

of Viceroy and Lieutenant-General in Canada, Hochelaga, etc., with Cartier as his lieutenant. Jacques Cartier, on May 23, 1541, sailed with five ships, a large company of colonists, and much stock and implements. The natives, at first friendly, became less so on finding that Donnacona and his companions had not returned. Cartier, therefore, moved from the St. Croix¹ up the St. Lawrence to Cape Rouge. Sending two vessels² with tidings back to France, he built a fort near Cape Rouge and named it Charlesbourg Royal.

On September 7, 1541³, Cartier went up the St. Lawrence river to the first "Sault of water"⁴, and then on to the "second Sault"⁵; but, because of the Indian's version of distance and his distrust of them, he did not go on to the third "Sault"⁶ on the Ottawa

1. Vid. p. 12 supra.

2. Cf. Biggar, op. cit., p. 253, note 4: "...The other two vessels, which subsequently returned to France, were called the Saint-Brieve and the Georges." And Ibid., loc. cit., note 9: "... These two vessels reached St. Malo on October 3. Jalobert at once set off to inform Francis I of Cartier's safe arrival in the river and to learn what were the king's wishes about taking re-inforcements to Cartier early in the year 1542."

3. Ibid., op. cit., p. 294, note 1: "The true date is 1541 (not 1540) ... Easter fell that year on 17 April."

4. Ibid., p. 257, note 4: "The rapid of St. Mary."

5. Ibid., p. 258, note 2: "The Lachine Rapid."

6. Ibid., p. 258, note 5: "The long Sault." And

river beyond which "Sault" was the great kingdom of Saguenay. To Cartier, therefore, remains that glorious distinction of promoting the first expedition ever undertaken by white man to explore the great and then unknown St. Lawrence waterway beyond Hochelaga (now known as Montreal).

Fearing that the Indians might treacherously make an attempt to kill him and the members of his band, he turned back to the fort at Charlesbourg Royal, intending there to winter. After a gloomy winter, having heard nothing from Roberval, and the Indians proving unfriendly, he, entirely discouraged and disgusted, abandoned his undertaking early in the summer of 1542, and sailed for France. At St. John's, Newfoundland, he met Roberval, with three ships and two hundred colonists of both sexes. But disheartened by hardships experienced during the past winter, Cartier refused to obey Roberval's command to turn back¹, and continued his homeward voyage to France.

also loc. cit., note 3: "Since according to the second Relation (p. 200) the best route to this kingdom of the Saguenay was up the Ottawa river, this would be the Long Sault with the Carillon."

1. Cf. Biggar, op. cit., p. 264 et seq.: "Jacques Cartier and his company returning from Canada..... with five sayles....when our General (Roberval) commanded him to goe backe againe with him..stole privily

Roberval wintered at Cape Rouge, but with much discomfort both from the severity of the winter and the unfriendliness of the Indians. No exploration of the St. Lawrence waterway was attempted by him. He made a trip up the Saguenay river, though, taking with him eight long-boats and some threescore and ten persons. He had much trouble during his stay in Canada. Besides the hostility of the Indians, Roberval had to give attention to disciplinary measures among the ranks of the colonists. They, most of whom were convicts, proved so insubordinate that the Governor had to hang some, and to scourge and imprison others.

Cartier was sent to Canada in 1543 to order the return of Roberval. He wintered for the third time in the country, and finally left in May, 1544, conveying with him the remains of an ill-fated colony. In 1549, Roberval, accompanied by his brother, Achille, formed another expedition to Canada¹, but after their departure they were never heard from any more. Thus ended in disastrous failure all the early expeditions to colonize and explore the regions of New France. It

away the next night from us, and without taking their leaves, departed home for Bretagne (Brittany)."

1. R. G. Thwaites, "France in America, 1497 - 1763," p. 9.

was not until half a century later that the next great French explorer of the St. Lawrence waterway and the Great Lakes landed upon the shores of the American continent.

Explorations by Champlain and Others

With the advent of the seventeenth century came the great French explorer, Champlain, who, as a member of Pontgrave's expedition to New France in 1603, was in later years to extend the French exploring activities far westward into the Great Lakes region. In the year 1603, when Champlain sailed up the St. Lawrence, the Huron - Iroquois race of Cartier's time were not there to greet him; they had vanished, as had also the villages of Stadacona and Hochelaga. But in their stead he found the Algonquins with whom a short time afterwards he made a formal alliance to join forces against the warring Iroquois. This pledge was in the following years to influence the course of discovery and exploration in the Great Lakes region.

Champlain and Pontgrave cruised up the St. Lawrence in 1603 as far as the St. Louis rapids. Champlain's next venture of exploration¹ was in June, 1609, when he ascended the St. Lawrence, joined forces

1. Wm. White, "The Annals of Canada," p. 3.

with the Algonquins, and pushed up through the Richelieu River to Lake Champlain in July, - the first white man to gaze upon its beautiful waters: "subsequently for 165 years to be the scene of contest between the Indian and the white man, the French and English, the revolted Colonies and the Mother Country"¹.

His next expedition² into the vast wilderness, hitherto untread by white man, was in 1613 up the Ottawa River as far as the Isle of Allumetts, while two years later, Champlain, accompanied by one - Joseph le Caron - of the Récollect fathers³, ascended the Ottawa to Mattawan, thence by way of Lake Nipissing and the French River to the Georgian Bay, where he turned southward and coasted down its rugged eastern shore, threaded a forest trail to the settlements of the Hurons lying on the narrows between Lake Couchiching and Lake Simcoe. Here Champlain joined a large group of Indians⁴, who, with several hundred canoes, sailed through Lake Simcoe,

1. W. Kingsford, "History of Canada," bk. 1, ch. 3-4, p. 31 ; Quoted in The New Larned History, 1922, Vol. 1, p. 1326.

2. J. H. Coyne, "The Pathfinders of the Great Lakes," in Canada and Its Provinces, Vol. 1, p. 49.

3. The Order of the Récollects, - the Fathers were Denis, Le Caron, Dolbeau, and Du Plessis. Vid. White, op. cit., p. 4.

4. Cf. Wm. White, op. cit., p. 4. ".....The Hurons, leaving their settlements near Lake Simcoe,

traversed the Balsam, Sturgeon, Pigeon, and Rice Lakes, with their intervening portages, glided down the devious windings of the Otonabee and Trent Rivers, and reached the beautiful Bay of Quinté. The Huron fleet then entered Lake Ontario, to which Champlain gave the name - which it long retained - of Lac St. Louis. The Hurons advanced upon the Onondaga settlements of the Iroquois located near Lake Canandaigua. They were unsuccessful in their campaign, but it afforded an opportunity for Champlain to discover Lake Ontario.

In the year 1610, Champlain traded a young Frenchman, Étienne Brulé to Iroquet, an Algonquin chief, for a young Indian to whom he gave the name of Savignon. Brulé had instructions from Champlain¹ to make observations regarding the inhabitants of the region in which he might happen to be, the country, its minerals, and everything of importance. He then disappeared into the wilderness where he explored much territory according to reports. In 1618, he and Champlain met at the St. Louis Rapids, at which time he disclosed to Champlain much concerning the region as far west as Lake Superior,

followed a south-easterly course until they struck the Otonabee and Trent rivers, down which they proceeded, reaching Lake Ontario by the Bay of Quinté."

1. Coyne, op. cit., p. 47.

traversed the Balise, Sturgeon, Pigeon, and Rice lakes, with their intervening portages, glided down the devious windings of the Otonabee and Trent Rivers, and reached the beautiful Bay of Quinte. The Huron fleet then entered Lake Ontario, to which Champlain gave the name - which it long retained - of Lac St. Louis. The Hurons advanced upon the Ojibwa settlements of the Iroquois located near Lake Canandaigua. They were unsuccessful in their campaign, but it afforded an opportunity for Champlain to discover Lake Ontario.

In the year 1610, Champlain traded a young Frenchman, Etienne Brule to Iroquois, an Algonquin chief, for a young Indian to whom he gave the name of Savignon. Brule had instructions from Champlain¹ to make observations regarding the inhabitants of the region in which he might happen to be, the country, its minerals, and everything of importance. He then disappeared into the wilderness where he explored much territory ascending to reports. In 1616, he and Champlain met at the St. Louis Rapids, at which time he disclosed to Champlain much concerning the region as far west as Lake Superior.

1. Champlain's account of his voyage up the St. Lawrence and Trent rivers, down which they proceeded, reaching Lake Ontario by the Bay of Quinte.

Brulé being the first white man¹ to gaze upon that vast expanse of water.

Jean Nicolet, some five years after Brulé's explorations, left Quebec, accompanied by Brébeuf, for Georgian Bay. From here they voyaged along the north shore of the Bay until they reached the Falls of St. Mary; after a short rest they proceeded westward to Michilmackinac (Strait of Mackinac) and Green Bay and out upon Lake Michigan. They were thus the first Europeans² to discover this Lake.

From 1629 an exploration was conducted chiefly by private fur traders and the Jesuit missionaries; the missionaries especially spread westward as far as Sault Ste. Marie where Dablon and Marquette, in 1668, founded

1. Cf. Coyne, op. cit., p. 57: ".....He was the pioneer explorer of the Province of Ontario, including Georgian Bay, the countries of the Hurons and Neutrals, and Lake Ontario, as well as the first to explore Northern New York and the Susquehanna River. He was the first white man to gaze on the rapids at Sault Ste. Marie and to visit the copper-mines of Lake Superior. Among the discoverers and explorers of the upper St. Lawrence basin he ranks first in time and one of the first in proformance, as he was also the first of these Frenchmen who settled among the native tribes as resident interpreters and fur traders After piloting the English to Quebec in 1629, and serving them during their occupation of Canada, he returned to the Huron country, and was clubbed to death and eaten by the Hurons at Toanche in 1632."

2. Vid. Coyne, "The Pathfinders of the Great Lakes," in Canada and Its Provinces, Vol. 1, p. 60.

a mission. Druillettes and André' were sent there to aid in the work in the year 1670.

After Nicolet's discovery of Lake Michigan, there remained only one more large Lake and a portion of the St. Lawrence waterway - the greater part of which is now known as the International Section - yet to be discovered and explored by the white man. The only one of the Great Lakes yet not discovered by the French was the Erie, although they did have, as early as the year 1640, some knowledge from the Indians of its existence; it was discovered a quarter of a century later - 1669 - by Jolliett who made a voyage upon it as far east as the mouth of the Grand River¹.

Concerning Lake Ontario and the stream connecting it with the sea, James H. Coyne writes: "Heretofore Lake Ontario had been a closed sea, fear of the Iroquois having prevented its use for navigation. No white man is known to have descended the St. Lawrence from the lake until 1653, when Father Poncet returned in a canoe by this route, or to have ascended it until 1657, when

1. Cf. Dawson, op. cit., p. 323 - 333: "Jolliett, went down Lake Erie only as far as the mouth of the Grand River. He did not see Niagara, but leaving his canoe on Lake Erie made a portage over to the head of Lake Ontario. He was the first to make a passage by way of Detroit, but while the upper lakes were all dis-

Father Simon le Moyne's canoe reached the Iroquois country"¹.

After Moyne's return to Quebec further exploration was undertaken, in 1658, by two enterprising young Frenchmen, Pierre Esprit Radisson and his brother-in-law, Médard Chouart, Sieur des Grossilliers. To them belongs² the honour of being the great discoverers and explorers of the regions contiguous to the upper Mississippi river. They were the first to explore the larger part, if not all, of Lake Superior and the territory surrounding it. They were also the first Europeans to visit many of the Indian tribes of the northwest, including the Crees, the Assiniboinés and the Sioux, and

covered, Niagara, the most remarkable point on the whole St. Lawrence system and the earliest to be talked about, was the last to be seen and described." And also Vid. Coyne, op. cit., p. 67: "..... In Jean Boisseau's map of 1643 the name Lake Erie makes its first appearance, but the lake is wrongly shown as the upper of Champlain's two slight expansions of the river between Lakes Huron and Ontario. The map of 1650 shows a distinct advance on all predecessors. Lake Erie appears as a great lake, but is unnamed. The Neutrals' country is indicated. Lake Ontario and the river St. Lawrence are named for the first time. Several streams are shown, including the Humber, Grand River, Kettle Creek and the Maitland. Lake Superior is named, and Lake Michigan and Manitoulin are charted, the latter unnamed, the former under the designation Lac des Puants (Lake of the Winnebagoes). Only the lower ends of the upper lakes, however, are shown."

1. Coyne, op. cit., p. 83.

2. Ibid., op. cit., p. 84 et seq.

quite possibly first to penetrate from the Great Lakes to James Bay to the north.

The result of their relations with the Indians of this remote west was that in the summer of 1660 they led a flotilla of sixty Lake Superior canoes loaded with furs back to Three Rivers. The two brothers-in-law, at once organized a new expedition and started west again in August, 1660. They were accompanied on this trip by several other Frenchmen, and gave escort to an aged Jesuit missionary, René Menard. Father Menard¹ went to Keweene Bay on Lake Superior, in the fall of 1660, and perished in the wilderness. Late in 1663 the news of his death reached Quebec.

Another Father named Allouez (or Père Alloussa) was sent to continue Menard's work. He was among the first explorers to cross the crystal waters of Lake Superior, when, in 1665, he paddled his frail canoe to its furthest extremity, and heard from the Sioux tribe of the vast prairies and great rivers beyond. In the fall of

1. Coyne, op. cit., p. 80.

Canada was under British rule from July, 1628, until 1632, when it was restored to the French. Charles I, King of England, commissioned Sir Henry Kirk, a Huguenot refugee, to occupy Canada. He reached the St. Lawrence in the summer of 1628, and sent a summons to Champlain to surrender. As peace had been declared before the surrender of Quebec, the French demanded its

1669 he spent the time among the Mascoutins, Foxes, Sacs, Winnebagoes, and Pottawatomies, and the following spring voyaged up the river, whose waters, as yet undiscovered by white man, laid beyond the intervening portage, and gazed upon the Wisconsin running to the southwest. Dawsons says: "He prepared the way for Marquette and Jolliett by founding the first mission on Lake Michigan"¹.

On May 17, 1673, Père Marquette and Jolliett, with five men, made their way to the northwest shores of Lake Michigan. They ascended the Fox River to its source, made a portage to the head waters of a tributary of the Wisconsin, paddled down with the current, and on June 17, came out upon the mighty Mississippi. For nearly two months they descended the majestic waters of the river, during which time they passed the mouth of the Illinois, the Missouri, and the Ohio. They cruised down stream to the mouth of the Arkansas, where they met hostile Indians and learned of much danger should

restoration. By the treaty of St. Germain-en-Laye, the whole of Canada, Cape Breton, and Acadia, was restored to France, and the red cross banner of England, after waiving for three years from the Castle of St. Louis, gave place to the lilled flag of France. Thus ended the English occupation of Canada until the treaty of Paris in 1763.

1. Dawson, op. cit., p. 328.

they proceed any farther; a hurried council culminated in a decision to turn back. They returned by way of the Illinois River, a portage to the waters of Lake Michigan, and thence through that lake to the Green Bay Mission, from whence they started for Quebec, which was reached about the end of September.

While the Jesuit Fathers were exploring the country, establishing missions among the Indians, and sacrificing their lives, and while the Indian wars of extermination were still in progress, the French farther east had already begun to feel the hostile influence of the English, especially their efforts to divert the fur trade down the Hudson river. To check this influence La Salle and Louis de Buade, Count de Frontenac, Governor of Canada, brought¹ about the erection of Fort Frontenac, in 1673, on the present site of Kingston located at the foot of Lake Ontario and commanding the entrance of the route down the St. Lawrence River. In the selection of the site for the fort, Frontenac had acted on the advice and recommendation of La Salle. It was in close proximity to the English trading post at Oswego, and served both as a stronghold and a market

1. Roberts, "A Short History of Canada", 1887, p. 84 et seq.

place for the traders. Its chief purpose was, however, to check the interference of the English traders from Albany and New York with the fur trade of the Indian allies of the French. Keen rivalry for the lion's share of commercial trade was felt even in those pioneering days!

About this time tidings of Jolliett's voyage southward reached Quebec. The glory of his discovery fired the ambition of Robert la Salle. He was eager to discover a water passage through the American continent to Japan and China. In 1676 he gave attention to developing Fort Frontenac as a trading station, and building a settlement around its stout walls. In the latter part of December, 1678, accompanied by Tonty, an Italian veteran, by Père Hennepin, and a small crew he sailed¹ in a brigantine, which was wrecked while enroute, from Fort Frontenac for the Niagara River, and erected a fort above the great cataract. On January 26, 1679, the keel of the first vessel ever upon the waters of the lakes above Niagara Falls was laid, and in May she was launched and christened the Griffon. August 7, 1679, she spread her sails to the breeze, and in three weeks reached the entrance to Lake Michigan.

1. Dawson, op. cit., p. 356 et seq.

La Salle freighted this pioneer vessel at Green Bay with a cargo of furs in order to appease the clamor of his creditors, and sent¹ her back to Niagara. She never reached her destination; but from bits of wreckage later discovered conclusive evidence points to her disastrous end in an autumnal storm sometime after her departure.

La Salle, being joined by the detachment of Henri de Tonty, and weary of waiting for the Griffon's return, resolved to explore the interior. Setting out on December 3, he made a portage across the intervening land from a place now called South Bend until he struck the head waters of the Kankakee River.

At an inhabited town near Lake Peoria, in the heart of Illinois, where he arrived on January 4, 1680, amid the despondency, mutiny, and desertion of his men, he built a fort to which, in allusion to his disasters and disappointments - for by this time he realized that the Griffon was gone - he gave the name of Crevecoeur, meaning Heartbreak.² After many adventures, he started, in February, 1682, with his little company in canoes, upon a journey to the mouth of the Mississippi,

1. Dawson, op. cit., p. 358.

2. Ibid., p. 359.

where he arrived on March 19. He claimed the vast mid-continent for France, under the name of Louisiana. His return up the stream was more difficult than he had calculated, thus delaying his arrival at Quebec until the spring of 1683.

The Importance of La Salle's Voyage

La Salle's voyage to the mouth of the Mississippi may appear to the reader a departure from the theme of exploration of the basin of the Great Lakes and St. Lawrence River, but, by virtue of his discovery and exploring activities in that region, France claimed not only the then discovered and partially explored basin of the St. Lawrence waterway, but that running southward to the Gulf of Mexico, and three quarters of a century later, at the Peace of Paris we find the establishment of a fundamental principle - reciprocal navigation privileges - which ever since has engaged the attention of American and British statesmen.

Events Leading to Cession of Territory East of Mississippi by France to Great Britain

We return to trace briefly the course of vicissitudes leading up to the promulgation of this foundational right of free navigation. Frontenac's policy of colonial administration often involved him in controversies with the Bishop, the Intendant, the Church,

and the Jesuits. The King, wearied with complaints, recalled Frontenac, in 1682, just about the time La Salle ventured forth upon the mighty Mississippi, and appointed M. de le Barre in his stead. La Barre found the whole country threatened with the outbreak of another Iroquois war. He had an enemy in bluff Colonel Dongan, Governor of New York, who persistently, though repeatedly instructed by the British government to preserve neutrality, with malicious tales persuaded the Iroquois to make war upon the French, and hinder the flow of the fur trade to Montreal. La Barre was unable to quell the eruption and was recalled in disgrace, being succeeded by the Marquis de Denonville. Immediately upon arrival in Canada, the Marquis left Quebec for Fort Frontenac, and in June, 1687, engaged and defeated the Senecas. He next erected palisaded posts at Toronto, Niagara, Detroit, Mackinaw, Sault Ste. Marie, and on the river Illinois; these were to serve as bulwarks against the activities of the ferocious Iroquois and the movements of the English.¹

The Massacre of Lachine on August 5, 1689, and the blowing up and abandonment of Fort Frontenac, led to the recall of Denonville by France, and the

1. Roberts, op. cit., p. 90 et seq.

re-appointment of the veteran Frontenac. It was a very critical moment. The colony was increasingly imperiled by the declaration of war between England and France, as an aftermath of the Revolution of 1688 whereby James II was replaced by William III, Prince of Orange, as King of England.

The ravages of war in Europe influenced the English and French colonists' struggle for possession of America. Frontenac waged and encouraged a ruthless border warfare. The English countered with attacks. Sir William Phips sailed up the St. Lawrence and commanded Frontenac to surrender; but Frontenac replied with cannon shot and repulsed the English invasion. The treaty of Ryswick¹, signed on September 20, 1697, terminated the war in both the New and the Old World, and restored to England and France the lands each previously held.

The War of the Spanish Succession broke out on the 15th May, 1702, in which England, Holland and Austria fought against France and Spain, and again the French in America stirred up their allies, the ferocious Abenakis, against the New England colonists. On March 13,

1. W. B. Munro, "Canada and British North America", p. 121, quoted in The New Larned History, 1922, Vol. II, p. 1335.

1713, at the small Dutch town of Utrecht, was signed a treaty technically leaving France in possession of the Lakes, but even then the English claimed through their alliance with the Iroquois the Lakes Ontario and Erie.

From then until her downfall in America, in 1763, France strove to link the Great Lake forts with the one at New Orleans at the mouth of the Mississippi by a chain of settlements and cordon of military posts built along the waterways of the interior, and thereby shut the rapidly growing English colonies into a narrow strip of territory; later to gradually push¹ them from the American continent. But her plan failed. The "Seven Years' War" of Europe, called the "French and Indian War" in North America, once more fanned the smoldering fire into flames. The French had only one-twentieth as many men to take the field as had the English colonies. Much fighting took place. On the morning of September 13, 1759, General Wolfe won a decisive victory on the Plains of Abraham, defeating the renowned French general, Montcalm. Nearly a year later Montreal was surrendered by the French and "with the

1. James O. Curwood, "The Great Lakes: the vessels that plow them.....with brief history of our inland seas", 1909, p. 180.

fall of Montreal in 1760, the last flag of the French passed from the Great Lakes. Their warships were destroyed, their forts in the North surrendered, and within a few months England was everywhere supreme along the Inland Seas".¹ With the surrender of Montreal on September 8, 1760, came from De Vaudreuil, commander of the French army, a capitulation which severed Canada from France forever.²

Thus passed the French empire in America,³ and following it in after years there was gradual removal of the despotic institutions of the middle ages which were supplanted by those of modern civilizations granting local self-government, free press, schools, and the abolition of unjust monopolies in trade. But of more particular interest to the inhabitants of the North American continent at that time was the establishment by Great Britain of the principle of "Freedom of Navigation" upon the river Mississippi which, in accordance

1. Curwood, op. cit., p. 183.

2. Roberts, op. cit., p. 162.

3. Cf. William MacDonald, "Documentary Source Book of American History," 1606-1926, Third Edition, Revised and Enlarged, (New York, 1926), p. 109: ".....In 1758, Louisburg, Niagara and Fort Duquesne were taken; in September, 1759, Quebec fell; and with the surrender of Montreal, in 1760, the French power in America came to an end. The war in Europe went on for three years longer. In June, 1761, at the instance of France, negotia-

with the covenants resting in the Treaty of 1763, then constituted the western boundary line separating the British territory from that beyond which was still claimed by the French.

tions for peace were opened; but the signature of the 'family compact' between France and Spain, in August, caused them to be broken off. Pitt urged immediate war with Spain; but his views were not supported by the ministry, and he resigned. War against Spain was, however, declared in 1762, and English forces took Havana and Manila. In September, negotiations were resumed; on November 3, preliminaries of peace were signed at Fontainebleau; and on February 10, 1763, the treaty was concluded at Paris. In compensation for the loss of Florida, Spain received from France so much of Louisiana as lay west of the Mississippi River, including both sides of the river at its mouth."

produced a heritage of international hate and domestic suffering. To Great Britain, by virtue of this treaty, fell the island of Cape Breton, the whole of Nova Scotia, Canada, and the Great West territory the western boundaries of which lay in the valleys of the Illinois and the Wabash, a number of the West India islands, and the East India possessions of France; while Spain ceded to England Florida and all territory east of the Mississippi under her flag.¹

With the advent of British possession, by right of conquest, of American territory, came not only an

1. MacDonald, op. cit., p. 109 et seq.

CHAPTER II

ESTABLISHMENT OF RECIPROCAL NAVIGATION RIGHTS

The Treaty of Paris - 1763

On February 10, 1763, there was signed at Paris, by men representing both the French and English Governments, a treaty - the Treaty of Paris - bringing to a close the awful ravages of the Seven Years' War which had laid desolate a large part of the European Continent, had slain a million or more of men, and produced a heritage of international hate and domestic suffering. To Great Britain, by virtue of this treaty, fell the island of Cape Breton, the whole of Nova Scotia, Canada, and the Great West territory the western boundaries of which lay in the valleys of the Illinois and the Wabash, a number of the West India islands, and the East India possessions of France; while Spain ceded to England Florida and all territory east of the Mississippi under her flag.¹

With the advent of British possession, by right of conquest, of American territory, came not only an

1. MacDonald, op. cit., p. 109 et seq.

immeasurably ampler liberty to the people of Canada, a loftier impulse to progress than ever before known, but also the inauguration of a fundamental principle of reciprocal navigation privileges, the foundation of which rests firmly within Article VII of the Treaty of Paris made and signed by Great Britain, France and Spain in 1763. The language of Article VII is unmistakably comprehensive in respect to mutual liberty, of French and British subjects, and to navigation upon the Mississippi River "from its source to the sea"; it sets in motion a principle, which, in possibly every subsequent treaty convention dealing in any way with matters relevant to the North American continent, irresistibly comes to the fore and arrests the attention of statesmen when considering other navigation problems.

So impressive and far reaching in its scope is this principle that it seems advisable to reproduce within this report that portion of Article VII appertaining to the establishment of reciprocal navigation privileges. The terms of Article VII establishing this fundamental principle, then particularly applicable to none other than the Mississippi River, but subsequently applied to international waterway disputes between

Great Britain and the United States, reads as follows:-

"VII..... it is agreed, that, for the future, the confines between the dominion of His Britannic Majesty, and those of his most Christian Majesty, in that part of the world, shall be fixed irrevocably by a line drawn along the middle of the river Mississippi, from its source to the river Iberville, and from thence, by a line drawn along the middle of this river, and the lakes Maurepas and Pontchartrain, to the sea; and for this purpose, the most Christian King cedes in full right, and guaranties to his Britannic Majesty, the river and port of the Mobile, and everything which he possesses or ought to possess, on the left side of the river Mississippi, except the town of New Orleans, and the island on which it is situated, which shall remain to France; provided that navigation of the river Mississippi shall be equally free, as well to the subjects of Great Britain as to those of France, in its whole breadth and length, from its source to the sea, and expressly that part which is between the said island of New Orleans and the right bank of that river, as well as the passage both in and out of its mouth. It is further stipulated that the vessels belonging to the subjects of either nation shall not be stopped, visited, or subjected to the payment of any duty whatsoever. The stipulations, inserted in the IVth Article, in favour of the inhabitants of Canada, shall also take place with regard to the inhabitants of the countries ceded by this article."¹

But the passing of French control in America did not mean that all hostilities were at an end for most of those Englishmen who conquered the French some time later united to gain their freedom from European surveillance, and we find that less than twenty years after the downfall of French domination and the establishment of reciprocal navigation privileges in the

1. MacDonald, op. cit., p. 111.

New World, there burst forth a conflict - the American Revolution - within the ranks of the British subjects themselves that culminated in the birth of a new nation on the North American continent.

The Revolutionary War - 1775-1781

The causes that brought about the American Revolution are beyond the scope of this thesis, and the reader may learn about them by referring to the works of Canadian and American historians. Suffice it then to mention here that at that time the general policy of Great Britain toward her American colonies was one of commercial repression. The colonists rebelled, and troops were sent to enforce submission. In September, 1774, a Continental Congress was assembled at Philadelphia, which, in an effort to avert independence, petitioned the King, though in vain, for the continuance of the colonial liberties.¹

On April 19, 1775, occurred the engagement, at Concord and Lexington, between the armed colonists - "Minute Men" - and the soldiers of the King, which culminated in the War of Independence, and Great Britain's loss of the American colonies.² After much

1. Roberts, "A History of Canada," 1918, p. 185.

2. Ibid., p. 186 et seq.

fighting, lasting for six long years, the final great and decisive act of this tempestuous drama was the capitulation, on October 19, 1781, at Yorktown, Virginia, of Lord Cornwallis with seven thousand troops.¹

The Treaty of Paris - 1783

A provisional treaty was concluded at Paris, on November 30, 1782, between the United States and Great Britain; a cessation of hostilities was declared by an armistice at Versailles, January 20, 1783. The definite treaty of peace into which was incorporated the same terms contained in the provisional indenture was concluded at Paris on September 3, 1783.²

By virtue of Article I³ of this treaty the British dominions resting within the confines of the North American continent were divided. The boundary line separating the new nation of the United States of America from the remaining British possessions lying to the north was indicated to pass through the middle of the Lake of the Woods, Lakes Superior, Huron, Erie, and

1. Roberts, op. cit., p. 191.

2. Wm. Malloy, "Treaties, Conventions, International Acts, Protocols, and Agreements between the United States of America and other Powers; 1776-1909", Vol. I, p. 580 et seq. And also P. M. Ogilvie, "International Waterways", 1920, p. 274, and Snow, "American Diplomacy", pp. 67 and 106.

3. ARTICLE I. His Britannic Majesty acknowledges

Ontario, and the connecting waters, and thence along the mid-channel of the St. Lawrence River to a point where the boundary line separating Maine from Nova Scotia was stated to be the St. Croix River, with a "line drawn from its source to the highlands which divide those rivers that empty themselves into the river St. Lawrence, from those which fall into the Atlantic ocean."¹

Many disputes, in the years that followed, concerning the exact location of the boundary line, have been adjusted by Great Britain and the United States through the medium of subsequent treaties. The United States

the said United States, viz. New Hampshire, Massachusetts Bay, Rhode Island, and Providence Plantations, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia, to be free, sovereign and independent States; that he treats with them as such; and for himself, his heirs and successors relinquishes all claims to the government, propriety and territorial rights of the same, and every part thereof. (Malloy, "Treaties, etc.", pp. 581 and 587.)

1. ARTICLE II. And that all disputes which might arise in future, on the subject of the boundaries of the said United States, may be prevented, it is hereby agreed and declared, that the following are, and shall be their boundaries, viz. From the north-west angle of Nova Scotia, viz. that angle which is formed by a line, drawn due north from the source of St. Croix river to the Highlands, along the said Highlands which divide those rivers, that empty themselves into the river St. Lawrence, from those which fall into the Atlantic ocean, to the northwesternmost head of Connecticut river, thence down along the middle of that river, to the forty-fifth degree of north latitude; from thence, by a line due west on said latitude, until it strikes

has no claim to any title whatsoever to the shores or bed of four of the Great Lakes (Lake Michigan lying wholly within the United States domain), or of connecting rivers or channels, or to the portion of the river St. Lawrence known as the international section, on the north side of the international boundary defined in Article II and subsequently mutually adjusted, nor has Canada any similar claim to any right or title to the shores of lands to the southward of the boundary line.

The physical properties of Canada and the United States are, according to the mutual and later revised final agreement of 1783, with one exception, entirely separate and distinct; that exception is the joint

the river Iroquois or Cataraguay; thence along the middle of said river into lake Ontario, through the middle of said lake until it strikes the communication by water between that lake and lake Erie; thence along the middle of said communication into lake Erie, through the middle of said lake until it arrives at the water-communication between that lake and lake Huron; thence along the middle of said water-communication into lake Huron; thence through the middle of said lake to the water-communication between that lake and lake Superior; thence through lake Superior northward of the isles Royal and Phelipeaux, to the Long Lake; thence through the middle of said Long Lake, and the water-communication between it and the Lake of the Woods, to the said Lake of the Woods; thence through the said lake to the most northwestern point thereof, and from thence on a due west course to the river Mississippi; thence by a line to be drawn along the middle of the said river Mississippi until it shall intersect the northernmost part of the thirty-first degree of north latitude.

control and right to use the waters of the river St. Lawrence, of the Great Lakes and of the channels that connect each.

Hon. Allen J. Furlow of Minnesota, in his speech in the House of Representatives of the United States, Friday, February 25, 1927, concerning the waters of the St. Lawrence basin, made the following remarks:

"In these waters, by the laws of nature, there can be no separate title, because the waters that today form a part of Lake Superior will in time become a part of the rushing torrent of Niagara, and still later on will furnish navigation depth to the ships in Montreal Harbor.

"The treaties by which we have separated those things which are in their nature separate, and by which we have joined and mingled the property which in its nature is joint and mingled, proceed step by step from the original peace treaty of 1782 onward to establish and clarify whatever rights, titles, and privileges the two nations possess."¹

1. Congressional Record Vol. 68, pt. 5, p. 4850, February 25, 1927. (69th Congress, 2nd session.)

South by a line to be drawn due east from the determination of the line last mentioned, in the latitude of thirty-one degrees north of the Equator, to the middle of the river Apalachicola or Catahouche; thence along the middle thereof to its junction with the Flint river; thence strait to the head of St. Mary's river; and thence down along the middle of St. Mary's river to the Atlantic ocean. East by a line to be drawn along the middle of the river St. Croix, from its mouth in the Bay of Fundy to its source, and from its source directly north to the aforesaid Highlands which divide the rivers that fall into the Atlantic ocean from those which fall into the river St. Lawrence; comprehending all islands within twenty leagues of any part of the shores of the United States, and lying between lines to be drawn due east

But the most important article of the treaty consummated in 1783 is number VIII which, at that time, with the commencement of the existence of the United States as a new nation on the North American continent, affirmatively recognized the principle set up in Article VII of the Treaty of Paris (1763) by the signatory powers thereto. That principle is in effect: that any nation cannot be shut off from its natural avenue to the ocean. In accordance with this navigation principle we find that Great Britain and the United States entered into an agreement, under Article VIII (which is reproduced hereunder) to the effect that:

"The navigation of the river Mississippi, from its source to the ocean, shall forever remain free and open to the subjects of Great Britain, and the citizens of the United States."¹

In his speech before the members of the House of representatives of the United States, Hon. Furlow of Minnesota further states that:

1. Malloy, op. cit., p. 583 and 589. And also vid. MacDonald op. cit., p. 209.

from the points where the aforesaid boundaries between Nova-Scotia on the one part, and East-Florida on the other, shall respectively touch the Bay of Fundy and the Atlantic ocean; excepting such islands as now are, or heretofore have been within the limits of the said province of Nova Scotia. (MacDonald, op. cit. pp. 205-206. Also vid. Malloy, op. cit., pp. 581-582, and 587-588.)

"We agreed that we, possessing rights in and control over the Mississippi River, had no right to deny to Great Britain and to those territories now comprising western Canada, such free right of commerce from and to the ocean. While it is true that this clause was based upon a geographical error, the principle involved was and continued to be the actual working basis of relationship between the two nations and ultimately gave to us, jointly with the Dominion,¹ those treaty-established rights in the St. Lawrence which we now possess."²

The Treaty of Amity, Commerce and Navigation
With Great Britain - 1794 - "Jay Treaty"

In the years following the making of the Treaty of Paris, in 1783, much dissatisfaction arose due to Great Britain's non-observance of the provisions agreed upon in regard to the removal of slaves from American soil and the withdrawal of troops. The relations between Great Britain and the United States were further strained, in the latter part of 1793, by orders from the British admiralty to seize all neutral ships carrying provisions, whose destination was some French port. England also had failed to evacuate the line of forts situated along the American side of the Great Lakes; it was not until 1796 that they were surrendered into the hands of the Americans.³

1. Dominion of Canada.

2. Congressional Record, Vol. 68, pt. 5, p. 4850, February 25, 1927. (69th Congress, 2nd sess.)

3. F. N. Thorpe, "Constitutional History of the United States, 1788-1861," Vol. 2, pp. 340-342, in The New Larned History, Vol. X, p. 8674.

On recommendation from Hamilton, George Washington, then President of the United States, on April 16, 1794, nominated John Jay, the chief justice of the Supreme Court, as Plenipotentiary and Envoy Extraordinary to negotiate with Great Britain.¹ The nomination was confirmed by a vote of 18 to 8, and Jay was chosen.

Jay sailed for England in May, 1794, reached London June 15, and on November 19, the "Treaty of Amity, Commerce and Navigation", commonly known as the "Jay Treaty", was concluded. This treaty was placed before the Senate, in a special session, June 8, 1795; on June 24 ratification was advised by that body after striking out the article on West Indies trade.²

Re-affirmation of Navigation Freedom
On Mississippi River

The interesting feature, similarly evolving from this treaty convention, is the mutual declaration of the fundamental principle of reciprocity in navigation rights which England so thoughtfully stipulated in the Covenant of 1763 with France. Once more is the freedom of navigation emphasized and made a stipulation by

1. Thorpe, op. cit., p. 340-342, in The New Larned History, Vol. X., p. 8674.

2. Malloy, op. cit., Vol. I, p. 590.

Article III of the treaty of 1794, which article particularly specifies that:

"The river Mississippi shall, however, according to the treaty of peace, be entirely open to both parties; and it is further agreed, that all the ports and places on its eastern side, to whichsoever of the parties belonging, may freely be resorted to and used by both parties, in as ample a manner as any of the Atlantic ports or places of the United States, or any of the ports or places of his Majesty in Great Britain."¹

Under the same article it was also agreed:

"No higher or other tolls or rates of ferriage than what are or shall be payable by natives, shall be demanded on either side; and no duties shall be payable on any goods which shall merely be carried over any of the portages or carrying-places on either side, for the purpose of being immediately re-imbarked and carried to some other place or places. But as by this stipulation it is only meant to secure to each party a free passage across the portages on both sides: it is agreed, that this exemption from duty shall extend only to such goods as are carried in the usual and direct road across the portage, and are not attempted to be in any manner sold or exchanged during their passage across the same, and proper regulations may be established to prevent the possibility of any frauds in this respect."²

That part of Article III dealing with the subject of "tolls or rates of ferriage" quoted above relates particularly to that portion of the St. Lawrence waterway system designated as the Great Lakes together with their linking channels. The stipulations stated

1. Malloy, op. cit., Vol. I, p. 592. See also MacDonald, op. cit., pp. 246-247.

2. Malloy, op. cit. loc. cit.

therein are also applicable to that portion of the river St. Lawrence located south of the forty-fifth parallel and now known as the "International Section."

Great Britain Explanatory Article to Article III

At a convention, held in Philadelphia, there was concluded on May 4, 1796, between Great Britain and the United States an additional agreement which, according to the terms thereof, "shall be added to and make a part of the said treaty" (1794).¹ It is in the nature of an explanatory article to Article III of the "Jay Treaty" consummated November 19, 1794, and explicitly provides that no Treaty Stipulation, subsequently to be made by either of the High Contracting Parties with any "other State or nation, or with any Indian tribe"² should diminish in any way whatsoever the complete freedom of navigation on all inland boundary waterways.

The Treaty of Ghent - 1814

Although the river St. Lawrence itself has been the cause of considerable controversy subsequently and the subject of many diplomatic exchanges between Great Britain and the United States, no alteration in the international statutable aspect of the stream took place

1. Malloy, op. cit., Vol. I, p. 609.

2. Ibid., I, p. 608.

from the birth of the treaty of 1794 until December 24, 1814, when the Treaty of Ghent was concluded.¹

By that treaty, the High Contracting Parties - Great Britain and the United States - further attempted to clarify the international line of demarcation that separates the two nations, which line² was supposedly to run along the course of the river St. Lawrence

1. MacDonald, op. cit., p. 244.

2. ARTICLE IV. Whereas it was stipulated by the second article in the treaty of peace..(1783) ..that the boundary of the United States should comprehend all islands within twenty leagues of any part of the shores of the United States, and lying between lines to be drawn due east from the points where the aforesaid boundaries, between Nova Scotia, on the one part, and East Florida on the other, shall respectively touch the Bay of Fundy, and the Atlantic ocean, excepting such islands as now are, or heretofore have been, within the limits of Nova Scotia; and whereas the several islands in the Bay of Passamaquoddy, which is part of the Bay of Fundy, and the island of Grand Menan in the said Bay of Fundy, are claimed by the United States as being comprehended within their aforesaid boundaries, which said islands are claimed as belonging to his Britannic Majesty, as having been at the time of, and previous to, the aforesaid treaty....., within the limits of the province of Nova Scotia; In order, therefore, finally to decide upon these claims, it is agreed that they shall be referred to two Commissioners to be appointed in the following manner, viz: One Commissioner shall be appointed by his Britannic Majesty, and one by the President of the United States, by and with the advice and consent of the Senate thereof..... (St. Andrews, N.B.. was chosen as the meeting place of the Commissioners. Should they disagree, then the matter was to be referred to some friendly "sovereign or State" for a solution.) Ref.: Malloy, op. cit., Vol. I, pp. 614-615.

(Iroquois or Cataraguy)¹ from a point thereon where the forty-fifth degree of north latitude intersected westward through mid-channel of the Great Lakes² with

1. ARTICLE V. Whereas neither that point of the high lands lying due north from the source of the river St. Croix, and designated in the former treaty of peace between the two powers as the northwest angle of Nova Scotia, nor the northwesternmost head of Connecticut river, has yet been ascertained; and whereas that part of the boundary line between the dominions of the two powers which extends from the source of the river St. Croix directly north to the abovementioned northwest angle of Nova Scotia, thence along the said highlands which divide those rivers that empty themselves into the river St. Lawrence from those which fall into the Atlantic ocean to the northwesternmost head of Connecticut river, thence down along the middle of that river to the forty-fifth degree of north latitude; thence by a line due west on said latitude until it strikes the river Iroquois or Cataraguy, has not yet been surveyed: it is agreed, that for these several purposes two commissioners shall be appointed, sworn, and authorized to act exactly in the manner directed with respect to those mentioned in the next preceding article, unless otherwise specified in the present article. (The meeting place of the Commissioners to be St. Andrews, N.B. The boundary to be surveyed and marked. In the event of non-agreement, the matter to be referred to some friendly "sovereign or State" for a solution, as set out in Article IV.) Ref.: MacDonald, op. cit., p. 291.

2. ARTICLE VI. Whereas, by the former treaty of peace that portion of the boundary of the United States from the point where the forty-fifth degree of north latitude strikes the river Iroquois or Cataraguy to the lake Superior, was declared to be "along the middle of said river into lake Ontario, through the middle of said lake until it strikes the communication by water between that lake and lake Erie, thence along the middle of said communication into lake Erie, through the middle of said lake until it arrives at the water communication into the lake Huron, thence through the middle of said lake to the water communication between

their connecting streams to the Lake of the Woods.¹
For this purpose, two commissioners were provided to
determine the boundary line.²

The Convention of Commerce
and Navigation - 1815

The convention of commerce and navigation in 1815
restored to the subjects of Great Britain and the citi-
zens of the United States all the privileges and rights

that lake and lake Superior." And whereas doubts have
arisen what was the middle of the said river, lakes
and water communications, and whether certain islands
lying in the same were within the dominions of his
Britannic Majesty or of the United States: In order,
therefore, finally to decide these doubts, they shall
be referred to two commissioners, to be appointed,
sworn, and authorized to act exactly in the manner
directed with respect to those mentioned in the next
preceding article, unless otherwise specified in this
present article. (The Commissioners to meet at the city
of Albany, N.Y. Boundary to be determined and designat-
ed. In the event their opinions cannot be reconciled
the matter to be referred to some friendly "sovereign
or State" for a decision as in Article IV.) Ref.: MacDon-
ald, op. cit., p. 292. Also Malloy, op. cit., pp. 616-617.

1. ARTICLE VII. It is further agreed that the said
two last mentioned commissioners,.....shall be, and
they are hereby authorized.....to fix and determine
that part of the boundary between the dominions of the
two Powers which extends from the water communication
between Lake Huron and Lake Superior, to the most north-
western point of the Lake of the Woods, to decide to
which of the two parties the several islands lying in
the lakes, water communications and rivers, forming the
said boundary, do respectively belong, in conformity
with the true intent of the said treaty of peace.....
(Should the Commissioners disagree, the matter then to
be referred to some friendly "sovereign or State" for
a solution, as in Article IV.) Ref.: Malloy, op. cit.,
Vol. I, p. 617.

2. Malloy, op. cit., p. 620. "The commissioners

they possessed by virtue of previous treaties.¹
Article II, of the treaty of 1815, among other stipulations, emphatically states that:

".....The intercourse between the United States and his Britannic Majesty's possessions in the West Indies, and on the continent of North America, shall not be affected by any of the provisions of this Article, but each party shall remain in the complete possession of its rights with respect to such an intercourse."²

The Bagot - Rush Agreement - 1817

On April 28, 1817, there was signed³ at Washington by Charles Bagot, representing Great Britain, and Richard Rush, acting in behalf of the United States, an agreement for the limitation of naval forces on the Great Lakes. Ratification was advised by the Senate on April 16, 1818, and a Presidential Proclamation

met September 23, 1816, and, having disagreed, held their last meeting April 13, 1822. By the convention of 1827 the dispute was left to the decision of the King of the Netherlands, who delivered his award January 10, 1831, which was not accepted by either Government and the boundary was finally agreed upon in the Webster-Ashburton treaty."

1. Malloy, op. cit., Vol. I, p. 624: "Concluded July 3, 1815; ratification advised by the Senate, subject to exception as to the island of St. Helena, December 19, 1815; ratified by the President December 22, 1815; ratifications exchanged December 22, 1815; proclaimed December 22, 1815."

2. Malloy, op. cit., Vol. I, p. 626.

3. Cf. Malloy, op. cit., Vol. I, p. 628. "Signed at Washington, April 28-29, 1817; ratification advised by the Senate, April 16, 1818; proclaimed by the President, April 28, 1818."

issued by James Monroe,¹ then President of the United States of America. Since the issuance of that proclamation, both nations have acquiesced in the provisions of the agreement, and upon or along these waters through which the international boundary runs, there have been neither fort nor ship nor gun to threaten or arouse suspicion of either nation toward the other.

1. BY THE PRESIDENT OF THE UNITED STATES OF
AMERICA

A PROCLAMATION

Whereas, an agreement was entered into at the city of Washington, in the month of April, in the year of our Lord one thousand eight hundred and seventeen, between Richard Rush, esquire, at the time acting as Secretary for the Department of State of the United States, for and in behalf of the government of the United States, and the Right Honorable Charles Bagot, His Britannic Majesty's Envoy Extraordinary and Minister Plenipotentiary, for and in behalf of His Britannic Majesty, which arrangement is in the words following, to wit:

"The naval force to be maintained upon the Amerilakes by His Majesty and the Government of the United States shall henceforth be confined to the following vessels on each side, that is -

"On Lake Ontario, to one vessel not exceeding one hundred tons burden, and armed with one eighteen pound cannon.

"On the Upper Lakes, to two vessels not exceeding like burden each, and armed with like force.

"All other armed vessels on these lakes shall be forthwith dismantled, and no other vessels of war shall be there built or armed.

"If either party should be hereafter desirous of annulling this stipulation, and should give notice to that effect to the other party, it shall cease to be binding after the expiration of six months from the date of such notice.

Navigation Rights Firmly Established

Thus we find that nearly half a century after the original establishment of the principle of complete freedom of navigation upon the Mississippi river, which it was Great Britain's foresight, as a maritime nation, to incorporate within the Treaty of Paris (1763) made with France and subsequently to become Article VIII of the Treaty of Paris (1783) entered into by her with the new nation in America, that the same fundamental

"The naval forces so to be limited shall be restricted to such services as will, in no respect, interfere with the proper duties of the armed vessels of the other party."

And whereas the Senate of the United States have approved of the said agreement, and recommended that it should be carried into effect, the same having also received the sanction of His Royal Highness the Prince Regent, acting in the name and on the behalf of His Britannic Majesty.

Now, therefore, I, James Monroe, President of the United States, do, by this my proclamation, make known and declare that the arrangement aforesaid, and every stipulation thereof, has been duly entered into, concluded and confirmed, and is of full force and effect.

Given under my hand, at the city of Washington, this twenty-eighth day of April, in the year of our Lord one thousand eight hundred and eighteen, and of the independence of the United States the forty-second.

By the President:

(Signed) James Monroe.

(Signed) John Quincy Adams.
Secretary of State.

Ref.: Malloy, op. cit., 1776-1909, Vol. I, pp. 628-630.

idea¹ becomes precisely a part of all later international agreements and emphatically provides that "no subsequent treaty.....should diminish in any degree the complete freedom of navigation on all boundary waterways."²

From this very brief account of the principle of reciprocal navigation rights, as established by Great Britain in the New World during the eighteenth century and its applicability to the great waterway system within the St. Lawrence basin, we now turn back the pages of history and retrace in a more or less chronological manner the early efforts to develop the inland waterways on the continent of North America, particularly those which form the subject matter of later controversial endeavors to reach from the head of the lakes to the sea by various proposed routes.

1. Vid. p. 35, supra. Also vid. Malloy, op. cit., 1776-1909, Vol. I, p. 589.

2. Paul M. Ogilvie, "International Waterways", (New York, 1920), p. 262.

CHAPTER III

EARLY EFFORTS TO DEVELOP INLAND WATERWAYS WITHIN CANADIAN TERRITORY

Nature Provides Great Natural Waterways

Although Nature did provide man with two great natural waterways, and possibly a third which ought not to be overlooked in this narrative, far into the heart of the American continent, she nevertheless did not carve for him an accessibly navigable system free from impediments in any of the outlets to the sea, but burdened each with some physical form of obstruction. First, and unquestionably the most significant from an economic standpoint, of the two natural waterways is the St. Lawrence River forming, as it does, the immediate elongation of the Great Lakes and their connecting channels whose waters traverse the St. Lawrence Basin as they flow eastward to the Atlantic Ocean. The other of the two great natural waterways is that mighty river - the Mississippi - with its numerous tributaries flowing meanderingly southward through the Mississippi Basin and discharging its sedimentary-laden waters into

The Gulf of Mexico. The third, and of somewhat lesser importance from a physical viewpoint, but of considerable importance from the economic viewpoint, is the beautiful Hudson, the waters of which gracefully flow through the drainage basin of the Mohawk Valley down the river to the sea.

Barriers to Free Navigation

But no one of these three waterways permits in its natural state of unobstructed access to the ocean by our present day forms of water transportation; each case presents barriers of one nature or another which require a relatively small amount of labor by the human hand to overcome the obstructions. The Mississippi waters are spread in a network throughout a vast area of the Middle West and are shallow for a considerable distance from their source with a natural barrier between the river system and the Great Lakes, now partially surmounted by the Illinois River and the Chicago Drainage and Ship Canal, the deepening of which would give impetus to and unite the barge traffic of the Mississippi with that of the Lakes. The Hudson River, likewise, above the city of Troy is unnavigable, and the natural barrier intercepting and impeding normally free passage from the Great Lakes can only be

overcome by a much more adequate canal system than now exists and one which could only be further developed by man with considerable expense if the greater volume of the commerce from the Great West territory is to be borne to the coast by this route for local consumption and transportation abroad. The St. Lawrence waterway system is obstructed from the foot of Lake Superior through the entire length of the connecting channels of the Great Lakes, to tidewater at Three Rivers eighty-six miles below Montreal, except at Lake Michigan, which is on the same water-level as Lake Huron and connected thereto by the Straits of Mackinac, a deep and navigable outlet.

Since in this report we are concerned only with the efforts to obtain an "International Highway to the Sea", particular attention will be given to the St. Lawrence route with but little consideration of the other two major outlets from the Great Lakes.

Brief Description of Physical Characteristics of St. Lawrence Inland Waterway System

In order to get a true picture of the St. Lawrence waterway in its natural state it may be appropriate at this time to briefly outline its physical characteristics. A more detailed description will be given in a later chapter.

From Quebec as far up the St. Lawrence as Lake St. Peter the water is of sufficient depth to permit large deep-draft vessels, but the lake itself is of uneven depth, many places having only ten to eleven feet of water at extreme low-water level. This depth of water was ample for the vessels of the eighteenth century, but with the advent of the nineteenth century came a preponderance of deeper and larger crafts and with them the problem of providing artificially a channel to reach the port of Montreal. Dredging was the solution of the problem. Above Montreal a distance of eight miles lies the Sault St. Louis, commonly known as the Lachine Rapids. Navigation was practically impossible for any type of craft except a canoe. When the British gained occupation of Canada, these rapids were the first to engage their attention. They built a canal around them primarily for military purposes and secondarily to aid the merchants and fur traders.

Next comes Lake St. Louis, some sixteen miles long and eight miles wide at some points. In the next thirteen miles the river passes through the Cascades Rapids, the Cedar Rapids, and the Coteau Rapids, opening out into a wide expanse of water known as Lake St.

Francis, thirty miles or more in length and, at its widest place, about five miles in breadth. Here, at the upper end of this lake, are the famous Long Sault Rapids with a drop of forty-eight feet. Now come several rapids in quick succession. At Farran's Point, Rapide Plat, Point aux Iroquois, Point Cardinal, and the Galops. From here navigation is unimpeded until at the western end of Lake Ontario the Niagara River and Falls are encountered. The greatest obstacle in the pathway of navigation lies at this point and necessitates the construction of a canal some twenty-seven miles in length. Above this cataract a clear road of sufficient depth of water is available, except some shallow places in Lake St. Clair, until the entrance to St. Mary's River is reached. Up this river about thirty-five miles are the St. Mary's Falls and Rapids, where in the half-mile stretch of these rapids the water level drops eighteen feet, above the Falls is again the St. Mary's River leading into the Superior Lake, fifteen miles distant, where open navigation for three hundred and ninety miles to the extreme western shore thereof is available.¹

1. Cf. M. J. Patton, "Shipping and Canals: The Canals of Canada," in the Edinburgh Edition of "Canada

Early Efforts by the French to Develop Canals

Under the French occupation of Canada there was little or no navigation improvements due to the fact that "the country south and west of Montreal was a wilderness little known, and that the fur trade that found its outlet through the Ottawa River was hardly of sufficient proportions to warrant any large expenditure on the construction of canals about the Island of Montreal."¹

An account of the several attempts by the French to provide water transportation facilities is so ably and clearly given by Mr. M. J. Patton in his article entitled, "Shipping and Canals: The Canals of Canada," in the Edinburgh Edition of "Canada and Its Provinces," 1914, Volume X, that it is here reproduced.

"That the rulers of New France did not do so"² was

and Its Provinces: A History of the Canadian People and Their Institutions by One Hundred Associates," Printed by T. & A. Constable at the Edinburgh University Press for The Publisher's Association of Canada Limited. (Toronto, 1914, Vols. I - XXIII), Vol. X, p. 503; Cf. also Ernest S. Clowes, "Shipways to the Sea: Our Inland and Coastal Waterways," Baltimore, 1929, pp. 73-74; and in addition Cf. also International Joint Commission of Canada and the United States, "Report on the St. Lawrence Navigation and Power Investigation, 1921," known as "Senate Document No. 114," 67th Congress, 2nd Session. (Washington, 1922) pp.15-16.

1. Patton, op. cit., Vol. X, pp. 503 - 504.

2. Construct canals. Cf. Ibid, loc cit.

not for the lack of urging and example. The Sulpicians had begun the improvement of the Little St. Pierre River on the Island of Montreal from its mouth to Lake St. Pierre, and the construction of a canal thence to a point above the worst part of the Lachine Rapids. Dollier de Casson, the superior of the Sulpicians, let the contract for the excavation, at this point, of a canal about a mile in length, twelve feet wide at the surface of the ground, and having a depth of eighteen inches at the period of lowest water in the St. Lawrence. Work was begun in the autumn of 1700, but the contract was never completed. The contractor became bankrupt in the following year, not, however, before he had excavated the amount required, with the exception of a cut three or four feet deep for a distance a little less than half a mile. The surplus revenues of the Sulpicians were never sufficient to complete the canal, but the French authorities hoped some day to be able to finish it.

"Louis XIV ordered plans and estimates of the work to be made in 1708, but the money to carry them out was not forthcoming. In 1714, Michel Begon, the intendant, urged upon the king the necessity of finishing the work so that the marble from a quarry discovered near the

Long Sault could be made available for use above the rapids, but it was said that the cost would be too great. Chaussegros, a French civil engineer, in 1717, reported that only about one-quarter of the whole canal remained to be finished, but the question of completing it was again deferred till 1733, when the same engineer submitted new plans involving a canal with locks costing 255,000 livres. But the 'no funds' complaint had become chronic, and the project was not carried through to completion."¹

Early Development of Canals in Canada
under the British Régime

To the British fell the actual task of improving the inland water communication system in Canada. Two interests were particularly insistent upon canalization of the St. Lawrence under the British régime. These two interests were first, and of primary importance, the military, and secondly, the commercial. "From the time of the Conquest to the outbreak of the War of 1812," says M. J. Patton, "the government of Canada always considered itself under the necessity of making preparation for a possible war with the United States.

"The frontiers of Upper Canada were most exposed

1. Patton, op. cit., Vol. X, p. 504.

to attack and to provide for their defence it was necessary to have free and unimpeded navigation from Lower Canada to the seat of danger. The St. Lawrence canals thus became one of the chief objects of concern to the British governors in Canada, and, up to the second decade of the nineteenth century, the imperial government either built or made substantial contributions towards the construction of canals that would be useful for military as well as for commercial purposes."¹

The importance of navigable water routes, made possible only by canal construction, as an incentive to the commercial development of the bordering country was fully appreciated by the inhabitants² of the two

1. Patton, op. cit., Vol. x, p. 505.

2. Cf. "Journals of the Legislative Assembly of Upper Canada" for years: 1812; 1814; 1816; 1817; and to April 1, 1818, inclusive: Sessional Papers No. 49, 50, 65, 70, 71, 72, 80, 82, and 85. Vol. XLV, Part III, Second Session of the Thirteenth Legislature of the Province of Ontario. Toronto: Printed and Published by L. K. Cameron, Printer to the King's Most Excellent Majesty. 1913. (Printed by Wm. Briggs, 29-37 Richmond St. W., Toronto.) (Sessional Paper No. 50, Ninth Report of the Bureau of Archives for the Province of Ontario, 1912, contains the Journals.)

Extracts from Journals of the Assembly, 27th Feb., 1816: "Mr. Nichol, first named of the Committee to manage the Conference with the Honorable the Legislative Council, reported that they had met a Committee of that House, and after a full discussion of the subject of the Inland Navigation of this Province had come to a joint resolution, which he was requested to

provinces - Upper and Lower Canada. From time to time the respective Legislative Assemblies¹ authorized in-

submit to the House as follows:-

"At a Conference held in the Chamber of the Hon. the Legislative Council on the 27th day of February, 1816, after a very full discussion on the subject of inland navigation, it was considered as the most eligible plan to appropriate a sum of money to enable the Governor, Lieutenant-Governor, or person administering the Government, to employ proper persons to make complete surveys of the different routes or water communications between the Lake Erie and Ontario, and between Lake Ontario and Lower Canada.

"That nothing further should be done respecting it until after the persons who may be appointed to make the surveys shall have delivered in a report with correct plans and estimates of the expense; and that after the appropriation shall have been made, the Governor, Lieutenant-Governor, or persons administering the Government be requested by Joint Addresses to take measures for carrying into effect, with as little delay as possible, the wishes and intentions of the Legislature.

(Signed) Robert Nichol, Chairman.
Ordered that the Report be received."

On 4th March, 1816, Mr. Nichol introduced a bill (Inland Navigation Appropriation Bill) "to appropriate a sum of money towards obtaining a correct survey of the Inland Navigation of this Province." This bill on 13th March, 1816, was laid upon the table for three months.

Cf. "Journals of the House of Assembly, Lower Canada." 1st Session, 1st Parliament - 4th Session, 15th Provincial Parliament. Dec. 1792 - 1837. Vol. 1 to 47. (In French and English.) Quebec: Printed by John Neilson, etc. 1793 - 1837. 27v.

1. The Lieut. Governor addressed the two Houses in a Speech in which he said, "The water communication of the River St. Lawrence, below Prescott, is also deserving of your serious consideration." Cf. Journal of the Assembly, 4th Feb., 1817. (Upper Canada.)

The Committee of the House on 25th Feb., 1817, gave consideration to the Lieut. Governor's speech relative to the River St. Lawrence. On 26th Feb., 1817, the following resolution was adopted:

vestigations to be made into the feasibility and cost

"Resolved, that it is the opinion of this Committee, that a Conference be requested with the Hon. the Legislative Council, to take into consideration that part of His Excellency's Speech at the opening of the Session, which relates to the improvement of the Navigation of the Saint Lawrence below Prescott, and to report the result of the same to the House.

"Resolved, that it is the opinion of this Committee that a Select Committee be appointed to inquire, if any or what improvements have been made by any individual in the Navigation of the River St. Lawrence during the last Session, the compensation, if any, incurred or to be allowed for the same, and that the said Committee have power to send for persons and papers,- and asked leave to sit again tomorrow."

Messrs. Rovinson, McMartin, McDonell, Cameron, and Casey were appointed as a Select Committee.

Mr. Robinson presented the following report:

"Agreeably to the order of this Honorable House the Committee to whom was referred the examination of what improvements have been made in the River St. Lawrence the preceding year, report that they have given that subject due consideration. They find that Alexander Hover has erected a lock at the Moulinette which, with other improvements, has cost him three hundred pounds; that during the last summer he had received five shillings for each boat passing.

"It appears to Your Committee that Alexander Hover, from being the only person who had made any improvements in the Navigation of the St. Lawrence is entitled to the consideration of Your Honorable House.

(signed) P. Robinson,

Chairman of the Committee."

A conference was held on 27th Feb., 1817 by Committees of the Assembly and Council; and the following resolutions framed and adopted:

"At a conference held in the Chamber of the Legislative Council, on the twenty-eighth day of February, it was agreed upon that in the first instance an appropriation be made to provide for obtaining a scientific survey of the River Saint Lawrence below Prescott, and a report on the improvements that are practicable; with separate estimates of the expense

of improving the water communication. But the Govern-

calculated for vessels or boats of different descriptions.

"That the Conferers should recommend to their respective Houses that the Committee be kept open, to enable them to report such further measures as they may deem expedient."

One year later (Feb. 26, 1818) the Joint Committees of the Assembly and Council of Upper Canada made the following report:-

"That a Committee of Conference between the two Members of the Legislative Council and four Members of the House of Assembly for the purpose of conferring on the subject of the improvement of the navigation of the St. Lawrence, the Committee, having taken into their most serious consideration the above subject, which they deem of the very first importance not only to this but to our Sister Province of Lower Canada, have unanimously agreed as a primary step for carrying the great work into effect, that they should recommend to their respective Houses to present a Joint Address to His Honor, the Administrator, requesting him to communicate the sense and feelings of the Legislature of this Province to His Majesty's representative in Lower Canada, stating a desire that concurrent means may be adopted by both Provinces for effecting so desirable an object on liberal and united principles, and that a mutual communication through His Majesty's Representative in each Province be made to their respective Legislatures, so that a mutual understanding may take place in adopting measures in accomplishing this great purpose."

"Legislative Council Office, 25th February, 1818."

The Committee of Conference drafted on Mar. 9, 1818, a Joint Address on the "Navigation of the St. Lawrence" which read as follows:-

"To His Honor Samuel Smith, Esq., Administrator of the Government of Upper Canada, &c., &c., &c.

"May it please Your Excellency: We, the Legislative Council and Commons House of Assembly of Upper Canada, in Provincial Parliament assembled, deeply impressed with the disadvantages which this Province labours under, from the difficulty and expense which it is subjected to in its access by the River St. Lawrence to and from Montreal, owing to the rapids and other obstructions in that River, many of which are

ments, especially that of Upper Canada, lacking a sufficiency of finances for such beneficial undertakings

in the territories of Lower Canada; and fully convinced that it will be of the first importance, not only to this, but also to our Sister Province, were the Navigation of that River improved, and to carry this great object into effect, as an incipient measure, humbly request Your Honor will be pleased to communicate the sense and feeling of the Legislature of this Province to His Majesty's Representative in Lower Canada, stating a desire that concurrent means may be adopted by both Provinces for effecting so desirable an object on liberal and united principles, essential to the interests of each Province in a commercial, and to our Parent Country, in a political view."

This Joint Address was delivered to His Honor the Administrator on March 11, 1818, by the Joint Committee to which the following reply was made:-

"Honorable Gentlemen, and Gentlemen:

"Sensible of how great importance will be the improvement of the navigation of the St. Lawrence between the two provinces of Upper and Lower Canada, I shall cheerfully comply with the purport of your Address, in communicating the sense and feeling of the Legislature of this Province to His Majesty's Representative in Lower Canada and solicit the adoption of concurrent measures for effecting so desirable an object."

Cf. "Journals of the House of Assembly, Upper Canada" for Year 1818, et seq.

The Second Session of the Seventh Provincial Parliament of Upper Canada was some time thereafter terminated. The Third Session opened on 12th October, 1818.

October 30th, 1818, His Excellency the Lieutenant Governor sent a message having attached thereto a Report of the Commissioners on inland navigation, to the House of Assembly of Upper Canada. The message read as follows:-

"P. Maitland, Lt. Governor.

The Lieutenant Governor transmits for the information of the Commons House of Assembly certain papers, including a Report of Commissioners relative to the improvement of the Navigation of the St. Lawrence. York, 30th October, 1818.

P.M."

as would encourage the progressive development of commercial and navigable communications, were seriously restrained in their worthy endeavors. However, gigantic as the financial aspects of the proposed project

"(Copy)

Niagara, October 6th, 1818.

Sir: In conformity to instructions from the Hon. Samuel Smith, late President administering the Government of Upper Canada, dated at York, the 7th day of August last, we proceeded to Quebec, and there reported ourselves to His Excellency the Governor General, and from him received instructions to meet the Commissioners appointed on behalf of Lower Canada under the authority of an Act of the Legislature of the Province (passed on the 1st April last) which we accordingly did at Montreal, on the 2nd day of last month, and we have now the honor to enclose to Your Excellency the Report of the Proceedings of the Commissioners on that and on the three following days.

This report we beg leave to mention to Your Excellency, is not conformable to what the Commissioners from Upper Canada wished, neither do we think it according to the tenor of the Act of the Lower Province, one of the Commissioners insisting that the Five Hundred Pounds voted by Lower Canada was to commence the improvement of the Navigation, whereas it appears evident that the Commissioners had only to make a Report of the measures appearing necessary to be adopted hereafter.

As to the most effectual way of improving the Navigation, we beg leave to give Your Excellency our opinion, being also the opinion of the most intelligent men of the Legislature of the Lower Province, which is, that one or two persons should be appointed from each Province, with adequate means to act in conjunction, for procuring with all possible dispatch accurate surveys, both of the St. Lawrence and Ottawa Rivers, together with estimates of Canals and Locks for boats and vessels of different constructions, to be laid before the two Legislatures for their selection and approval.

We herewith send a copy of the law of Lower Canada, (Cap. X) relative to the improvement of the navigation between the two Provinces.

may have appeared to the inhabitants at that time, they were none the less resolute in their determined efforts.

We have the honor to be Your Excellency's most obedient humble servants,
(True Copy, Geo. Hillier, (Signed) Thomas Clark,
P. Secy.) Jas. Crooks."

"We, George Gordon and Joseph Papineau, Esquires, two of the Commissioners appointed by His Grace the Duke of Richmond, Captain General and Governor in Chief in and over the Province of Lower Canada, etc., etc., etc., under the Provincial Statute passed in the fifty-eighth year of the reign of His Present Majesty, Chapter tenth, having met at Montreal on the 2nd day of September, in the present year, the Hon. Thos. Clark and James Crooks, Esquire, two of the Commissioners appointed by His Honor Samuel Smith, Administrator of the Government of the Province of Upper Canada, in virtue of the Joint Address of the Hon. the Legislative Council and House of Assembly of said Province, bearing date the tenth day of March of this present year, and having communicated their respective powers, and deliberated upon the duty assigned them, have agreed to the following Resolutions, on which to found the Report to their respective Provinces, viz.:

FIRST. That they are fully convinced that no Public undertaking will be more conducive to the progress and prosperity of the agriculture and commerce of both Provinces, to the augmentation of their wealth in the time of peace, and to their security and defence in time of war, than by facilitating the communication of their internal Navigation.

SECOND. To Secure to these Provinces the advantages of trade they already possess, it is urgent that no time should be lost in forwarding the work necessary to facilitate such water communication before the United States may have completed their grand Canal from Lake Erie to the Hudson River, in the State of New York, which canal when so completed will carry to New York the numerous and precious cargoes which would continue to be exported by the Province of Quebec if both Canadas availed themselves of the means they have to carry the same at a --- expense and in a shorter time by the natural outlet of the St. Lawrence.

The resourcefulness and perseverance of these very diligent inhabitants of Upper Canada is without a doubt vividly portrayed by Robert Nichol, Chairman of

THIRD. The Navigation of the Saint Lawrence is impeded by the Rapids between Montreal and Lachine, being a distance of from six to nine miles, and also by the Rapids between the head of the Lake Saint Lewis and the Lake St. Francois, being a distance of from twelve to fifteen miles; and by the Rapids above the Lake St. Francois in a distance of about forty-five miles, making in all about seventy miles. These impediments may be overcome by Canals and Locks constructed in a proper manner.

FOURTH. That for the greater utility and advantage of both Provinces, it is necessary that Canals and Locks should be constructed of the same dimensions in the one as in the other, so that vessels of the same description may pass through the whole.

FIFTH. That it appears to the said Commissioners that the dimensions and proportions of these Canals and Locks ought to be of no less size than those of the Great Western Canals in the State of New York, which are rated at forty feet in width on the water service (sic.), twenty-eight feet at the bottom, and depth of water four feet; the length of each Lock ninety feet, and twelve feet wide in the clear, and for the first sixty-two miles of which from Buffalo to the eastern extremity of the summit level is estimated at the expense of four hundred and fifty thousand dollars, and from Seneca River to Rome, a distance of seventy-seven miles, at the expense of eight hundred and fifty-three thousand, one hundred and eighty-six dollars; but as many items in these estimates would not be incurred in the contemplated one in this country, from the peculiarly favorable situation of the ground, and having an inexhaustible supply of water at the summit level, probably six hundred thousand dollars would suffice.

SIXTH. That the Commissioners of the Lower Province are at the present time willing to cause a survey level and estimate of the expense of the work to be done within the limits of their Province, both by the Saint Lawrence and Ottawa; but the Commissioners of the Upper Province, having neither the means nor instructions to enter upon this measure, the undersigned Commissioners unanimously agree to recommend

the Select Committee on Internal Revenues in his report¹ submitted on 31st March, 1821, to the Commons House of Assembly of Upper Canada. He reported that

to their respective legislatures that Provision may be made by law to prevent the construction of any public Canal at the places above mentioned of less dimensions than those stated in Number Five, and to recommend the enactment of such laws as may be necessary for the immediate and prompt execution of the improvements contemplated.

In witness Whereof we have hereunto signed our names at Montreal, the fifth day of September, in the Year of Our Lord one thousand eight hundred and eighteen, and of His Majesty's Reign the fifty-eighth.

(Signed) Jos. Papineau.

A true copy.
George Hillier,
P. Secretary.

George Garden,
Thos. Clark,
Jas. Crooks.

The Committee of the Assembly, on 31st of October, 1818, adopted the following resolution:

"Resolved, that a Conference be requested with the Honorable the Legislative Council upon His Excellency the Lieutenant Governor's message on the subject of the Improvement of the Navigation of the waters of the Saint Lawrence."

1. Cf. "Journals of the House of Assembly of Upper Canada" for the First Session of the Eighth Provincial Parliament - From 31st January, 1821, to 14th April, 1821.

On 31st March, 1821, "Mr. Nichol, from the Select Committee on Internal Revenues, presented a report, which was received, and read as follows:-

First report of the select committee appointed to take into consideration the Internal Resources of the Province, in its agriculture and exports, and the practicability and means of enlarging them; also to consider of the expediency of granting encouragement to domestic manufacturers. Large sums are also annually levied on the trade of Upper Canada, under Acts imposing duties for improving the navigation of the Saint Lawrence, which duties, while they add to the embarrassments of our export trade, give it no additional safety or accommodation, a great part of

the fact that it was perfectly practicable to connect the Lakes Erie and Ontario with Montreal by canals of sufficient depth to enable vessels of burthen (sic.)

the money raised from them remaining at this time in the hands of the Receiver General of Lower Canada unexpended.

Your Honorable House cannot fail to perceive the existence of the causes to which we have called your attention, as affecting the value of our staples; but there are others of not inferior interests, viz., the difficulties occasioned by the dangerous navigation of the river Saint Lawrence, the interruption occasioned by the Falls of Niagara, and the heavy charges to which every article of export is subject in transit to a market, from the numerous agents and persons employed in the transportation of them, and from the accidents which frequently occur from the insecure nature of the communication. These charges not infrequently swallow up the entire value of the article exported.

Your committee cannot omit to mention the peculiar hardship with which these accumulated impediments and restrictions bear upon the inhabitants of the Western Districts of the Province, and which render unavailing the natural advantages which they so eminently possess. With a fertile soil and mild climate, they are labouring under the most serious evils. Their remote situation exposes them to the multiplied charges on every article which they buy or sell, while the reduced value of the article flour, their principal, or indeed only article of export, and the difficulty of getting it to market, render it almost impossible to export it at all.

Your Committee have to express their regret, that for want of more full information they are unable to do justice to this important and interesting inquiry. They recommend to the serious consideration of your Honorable House a subject which involves the best interests of the Province, but to which they fear no adequate remedy can be provided by the Provincial Legislature.

Your Committee are unable to advise any temporary measures for augmenting the value of our staples, or for increasing as well as facilitating the exportation of them, being impressed with the belief that permanent measures can alone save the commerce of Upper Canada from the ruin with which it is menaced.

to sail, without unloading, directly to that port could not be doubted. He asserted that the successful enterprise of their zealous neighbors (people of the United

In reflecting upon the permanent system to be adopted for securing the safe, easy, expeditious, and economical exportation of our staple articles to the markets to which we have access, your committee have not been free from difficulty; the limited power and deficiency of pecuniary means of the Provincial Legislature, almost preclude the possibility of legislating on the subject. Still its importance imperiously demands that every attention should be paid to it. The measures which your Committee recommend are:

1st - A revision of the Inspection Laws, and prohibiting the exportation of any flour from the Province, until it has been inspected and branded Upper Canada, fine, superfine, or as the case may be.

2nd - An application to the Imperial Parliament claiming their interference to protect the staples of Upper Canada against any Acts of our Sister Province which might otherwise affect the same.

Also, a modification of her corn laws, in such manner as to admit at all times the bread stuffs of this Province into the British markets, subjecting them only to duties when below a certain average. Also, the reduction of the sterling duty on rum imported from other British colonies to the same rate, as is by law imposed on that article coming from the West Indies and Bermuda, and that she will continue her protection to the Canadian lumber trade. But the great and indeed only efficient measure by which, in the opinion of your Committee, a permanent relief can be afforded to the commerce of Upper Canada, "and the safe, easy, expeditious and economical exportation of our staples to the markets to which we have access can be secured," is the improvement of our inland navigation.

This is a measure, which in the opinion of your committee, claims the earliest and most profound attention of your Honorable House. It is a measure deeply involving the national interests as well as the commercial prosperity of the Province, and one, which if entertained by your Honorable House, should in the opinion of your Committee be undertaken on an extensive scale, a scale commensurate with the increasing power

States) sanctioned their committee in forming this opinion, and was an example which should have excited them to similar exertion. Mr. Nichol further asserted

and rapidly accumulating commercial resources of the Province.

That it is perfectly practicable to connect the lakes Erie and Ontario with Montreal by canals of sufficient depth to enable vessels of burthen to sail without unloading directly to that port cannot be doubted. The successful enterprise of our zealous neighbours sanctions your Committee in forming this opinion, and is an example which ought to excite us to similar exertions.

We ought not to allow ourselves to be deterred by the magnitude of the undertaking from undertaking at all. Difficulties there are no doubt, but they are not insuperable, and will be found to be comparatively insignificant when encountered by perseverance and determination.

That the Province is without funds for carrying on a work of this nature, upon even the most moderate scale, your Committee most readily admit; but they are also inclined to believe that by a proper representation of the subject to His Majesty (whose gracious intentions have already been communicated to the House) and to the imperial Parliament, setting forth the real and substantial advantages which the opening a water communication upon a grand scale from lake Erie to the sea, would produce to the interests of the Mother Country and the colonies, that His Majesty and His Imperial Parliament would concur in enacting such laws, and in giving such facilities and encouragement to this stupendous undertaking as would insure its success.

To entitle ourselves, however, to the active aid of the Imperial Government in this great measure we must evince a disposition to contribute to it to the extent of our means, and even if it were possible to go beyond them; for we ought not to expect our Mother Country to expend her resources for our benefit, while we who will so immediately reap the advantage are restrained by cold, narrow, selfish feelings from giving our fullest support to the measure necessary to its success.

By the report of the American Canal Commissioners

that the people of Upper Canada should not allow themselves to be deterred, by the magnitude of the undertaking, from undertaking at all. He said that there

in January, 1817, it appears that the great Western Canal, when completed will be in length 353 miles 29 $\frac{1}{2}$ chains, in width on the water surface 40 feet, in width at the bottom 28 feet, and in depth of water 4 feet. That the estimate of the total expense for completing the said canal is four millions eight hundred and eighty-one thousand seven hundred and thirty-eight dollars; or, at the average rate, including the expense of constructing seventy-seven locks of about \$13,830, or a little more than £3,000 sterling per mile. And from subsequent reports of the same commissioners it appears that hitherto the work has been done at a rate greatly within the estimate. This then is data for us to go upon, and by which we may be enabled to form a tolerably correct estimate of the sum it would require to complete a work of such vast public utility. Your Committee in this first report, do not consider it necessary, neither are they prepared to go into any detail respecting the canal. They wish merely to draw the attention of the Government and the House to the subject. The views, however, of your Committee generally are that a work of this description should not be on an exposed frontier, but should be wherever circumstances admit of it inland. Could it be completed on a scale which would enable the Government to bring the smaller sized vessels of war right into the lakes it would prove in the opinion of your Committee the best barrier against the future hostile attempts of the United States of America that could be formed. Military protection and commercial facility would thus be united, and the Province of Upper Canada, instead of being as it is at this particular time a dead weight upon the Government and commerce of Great Britain, would be one of their most flourishing colonies.

Your Committee, therefore, respectfully recommend to your Honorable House to pass a bill appointing commissioners.

First - To devise and adopt such measures as shall be requisite to facilitate and effect a communication by canals and locks between the lakes Erie and Ontario, and lake Ontario and Montreal.

were difficulties, no doubt, but they were not insuperable, and would be found to be comparatively insignificant when encountered by perseverance and determination.

Second - To examine and explore the country for the purpose of determining the most eligible routes for the contemplated canals; to cause surveys and levels to be taken, and maps filed, books and draughts to be made, and to adopt and recommend proper plans for the construction and formation of the said canals, and of the locks, dams, embankments, tunnels and aqueducts and to cause all necessary plans, models and draughts thereof to be executed.

Third - To calculate and estimate the expense of the above operation.

Fourth - To devise and recommend ways and means for carrying the above purposes into effect.

Your Committee having given their ideas on this important subject, recommend them to the consideration of your Honorable House.

With respect to the last head of inquiry, viz., Whether any, and if any, what nature of encouragement it is expedient to give to the manufacturer of salt and iron, for home consumption.

Your Committee have to remark that it is deemed sound policy in every country to protect domestic manufacturers, provided it can be done without making too great a sacrifice of other objects.

Domestic manufactures give a value to our raw materials, and serve to retain within the Province Capital, of which it must be deprived for the payment of similar articles when imported.

Your Committee, however, are not prepared to recommend a system of bounties as the Provincial Revenue at this time is not adequate to pay them, even if it were deemed advisable to do so. They are of the opinion that the manufacture of the necessary articles of salt and iron should be encouraged by every practicable means. But that until the Public Revenues of the Province are freed from their present embarrassment the only measure which it will be prudent to adopt is to impose heavy duties on similar articles when imported from the United States.

All of which is respectfully submitted.

Committee Room
31st March, 1821

Robert Nichol, Chairman"

Prior to the date of Mr. Nichol's report, however, efforts had already been made to further the development of this great and important project for water communication between the two Provinces. On 2nd November, 1818, the Joint Committee from the Legislative Council

Consideration was given on 10th April, 1821, to the Report on Internal Revenues by the whole Assembly gathered as one Committee. Certain Resolutions were drafted and submitted to the House for adoption, which was accomplished. The resolutions read as follows:

"Resolved - That by an Act of the Parliament of Lower Canada, passed in the forty-eighth year of his late Majesty's reign, entitled "An Act to provide a permanent fund for the improvement of the inland navigation of the river St. Lawrence", considerable sums have been at various times raised and collected from the trade of Upper Canada, of which a large amount appears to have been in the hands of the Receiver General of that Province unexpended on the 1st day of November, 1819, while the object for which it was imposed is unaccomplished.

Resolved - That it is the opinion of this House that the River St. Lawrence and intermediate ports thereof, being the channel of communication between this Province and the sea, ought not to be subject, and of right are not subject, with respect to duties on commercial regulations, to the control of the Legislature of Lower Canada, that power being by the 31st Geo. III, Chapter 31, reserved to the British Parliament.

Resolved - That in order to protect the interests of Upper Canada, as well with respect to commercial regulations as imposing duties, it has become expedient to apply to the justice and impartiality of the Imperial Parliament:

Resolved - That the most efficient measure to secure the safe, easy, economical and expeditious exportation of our staples to the ports and markets to which we have access is the improvement of the inland navigation on a scale commensurate with the rapidly increasing commercial resources of the Province.

Resolved - That it is the opinion of this House

and Commons House of Assembly of the Province of Upper Canada adopted certain resolutions¹, which later received the concurrence of both Houses.

that an Act be passed providing for the appointment of commissioners: 1st - To devise and adopt such measures as shall be requisite to facilitate and effect a communication by Canals and locks between the lakes Erie and Ontario, and lake Ontario and Montreal. 2nd - To examine and explore the country for the purpose of determining the most eligible routes for the contemplated canals, to cause surveys and levels to be taken, and maps, field books, and draughts to be made, and to adopt and recommend proper plans for the construction and formation of the said canals and of the locks, dams, embankments, tunnels, and aqueducts, and to cause all necessary plans, models, and draughts thereof to be executed. 3rd - To calculate and estimate the expense of the above operation. 4th - To devise and recommend ways and means for carrying the above purposes into effect.

1. Cf. "Journals of the House of Assembly, Upper Canada", for year 1818, et seq.

A conference between the Council and Assembly, both Houses of Upper Canada, was arranged and on 3rd November, 1818, Mr. Durand, of the Committee from the Assembly, reported that the Joint Committee (of Upper Canada) had met, and had agreed to certain Resolutions, which he was instructed to submit to the consideration of the House (Assembly.) The Resolutions read as follows:-

"Resolved, That it is the opinion of this House that the present state of the pecuniary resources of this Province is wholly inadequate to accomplish this important object without recourse to other means than are within the control of its Legislature.

Resolved, That it is the opinion of this House that could a liberal grant of the Waste Lands of the Crown be obtained, say to the extent of one hundred thousand acres, they might be disposed of at public sale, and would furnish sufficient funds, added to the liberal Legislative appropriation, to carry this desirable project into effect.

Resolved, That it is the opinion of this House that a Joint Address be transmitted to His Royal Highness the Prince Regent, praying that he would be

Amongst the accepted resolutions was one of primary importance; this one proposed that a Joint Address be transmitted to His Royal Highness the Prince Regent

graciously pleased to direct that one hundred thousand acres of the waste lands of the Crown should be vested in Trustees, with instructions that the same may be disposed of at Public Sale, and the proceeds appropriated to assist in defraying the expenses of cutting a canal in the Province of Upper Canada to communicate with similar works in the Province of Lower Canada that will connect the same.

Resolved, That it is the opinion of this House that in order to ascertain the best plans whereon to construct the proposed works, and to estimate the probable expense, a skilful Engineer should immediately be employed, to make the necessary surveys, and that a Joint Address be presented from both Houses to His Excellency the Lieutenant Governor, praying that he will be pleased to appoint a Civil Engineer for that purpose, to act in conjunction with such person as may be appointed by the Government of Lower Canada for the like duty."

As a consequential event resulting from the Joint Committee conference, another Joint Committee on 7th November, 1818, drafted an Address to His Royal Highness the Prince Regent.

On the 19th November, 1818, "The Joint Address to His Royal Highness the Prince Regent, on the subject of a Grant of Land, and to His Excellency the Lieutenant-Governor, praying him to transmit the same, were then read, passed, and signed by the Speaker as follows:

"To His Royal Highness, George, Prince of Wales, Regent of the United Kingdom of Great Britain and Ireland.

May it please Your Royal Highness: The importance of the navigation of the River Saint Lawrence, the chief communication to Quebec, the only seaport in His Majesty's Province of Upper Canada and Lower Canada, having been under consideration of their respective Legislatures, they have concurred to attempt its amelioration by Locks and Canals.

His Majesty's Faithful Subjects, the Legislative Council and Assembly of Upper Canada, humbly represent

of Great Britain praying that a grant of one hundred thousand acres of the "Waste Lands of the Crown" within the Province be placed under the control of Trustees,

to Your Royal Highness the inadequacy of the means under their control to effect a purpose so advantageous to the National Commerce, as well as the prosperity of this extensive and growing Colony, and respectfully solicit that such a grant of the waste lands of the Crown in this Province as Your Royal Highness, in behalf of His Majesty, may be pleased to bestow; by the sale whereof to aid the efforts of His Majesty's Faithful subjects in so useful an undertaking."

"To His Excellency Sir Peregrine Maitland, Knight Commander of the Most Honorable Military Order of the Bath, Lieutenant-Governor of the Province of Upper Canada, Major-General Commanding His Majesty's Forces therein, &c.

May it please Your Excellency,- We, His Majesty's most dutiful and loyal subjects, the Legislative Council and House of Assembly of the Province of Upper Canada, in Provincial Parliament assembled, beg leave to inform Your Excellency that we have agreed upon an Address to His Royal Highness the Prince Regent, praying him that he would be graciously pleased to appropriate a certain portion of the waste lands of the Crown for the purpose of improving the navigation of the River St. Lawrence, and cutting canals through this Province.

We therefore humbly request that Your Excellency will cause the said Address to be transmitted so that it may be laid at the feet of His Royal Highness."

These Addresses were delivered to the Lieutenant Governor on 20th November, 1818; he replied:

"Honorable Gentlemen and Gentlemen:- I shall lose no time in forwarding your Joint Address to His Royal Highness the Prince Regent through the proper channel."

The Lieutenant Governor, on 24th of February, 1820, addressed a message to the Assembly in the following language:

"P. Maitland.

The Lieutenant Governor acquaints the House of Assembly that, having forwarded to His Royal Highness the Prince Regent a Joint Address of the Legislature, praying that a grant of the Crown Lands be made to aid in

"with instructions that the same may be disposed of at Public Sale, and the proceeds" applied to the defrayal of expenses which would be incurred by constructing a

the improvement of the navigation between Upper and Lower Canada, he has received thereupon His Royal Highness' pleasure, signified by His Majesty's Secretary of State for the Colonial Department as follows:-

That His Royal Highness will readily afford assistance towards the important object which they have in view of facilitating the communication between the Upper and Lower Province, but before entering into a discussion of the mode in which this assistance shall be afforded it will be necessary that His Royal Highness should be correctly informed as to the extent of the grants of money which the Legislature feel it within their power to vote and apply to this purpose, and as to the regulations under which the money voted for it is to be applied.

24th February, 1820.

P.M."

An acknowledgment of the message from the Lieutenant Governor was prepared, passed and signed after the third reading on 29th February, 1820. The Address read as follows:-

"To His Excellency, Sir Peregrine Maitland, K.C.B., Lieutenant Governor of the Province of Upper Canada, and Major General Commanding His Majesty's Forces in the Province of Upper and Lower Canada, etc., etc., etc.

May it please Your Excellency: We, His Majesty's dutiful and loyal subjects, the Commons of Upper Canada in Provincial Parliament assembled, humbly thank Your Excellency for Your message, communicating the gracious intention of His Royal Highness the Prince Regent to afford assistance towards improving the communication between Upper and Lower Canada, whenever he shall be correctly informed of the extent of the grant of money which the Legislature feel it within their power to vote and apply to this purpose, and as to the regulations under which the money voted is to be applied; to which subject they will give due consideration.

Commons House of Assembly
29th February, 1820.

Allan McLean, Speaker"

A Committee, composed of Messrs. Fraser and Cotter, were appointed to deliver the Address on the same day.

canal in the Province of Upper Canada "to communicate with similar works in the Province of Lower Canada that will connect the same."¹ This Joint Address,² by mutual agreement of both Houses of Upper Canada, was composed and transmitted through the office of the Lieutenant Governor to the proper authorities in Great Britain shortly thereafter.

A reply from His Royal Highness the Prince Regent was transmitted by the Secretary of State for the Colonial Department of the Imperial Government to the Lieutenant Governor Sir Peregrine Maitland, K.C.B. He in turn, on the 24th February, 1820, informed the House of Assembly by message,³ in the language of the letter received by him from the Colonial Department, that His Royal Highness would readily afford assistance towards the important object which they had in view of facilitating the communication between the Upper and Lower Provinces, but before entering into a discussion of the mode in which this assistance should be afforded it would be necessary that His Royal Highness be correctly informed as to the extent of the grants of money which the

1. Vid. p. 78 supra, note 1.

2. Vid. p. 79 supra, note 1.

3. Vid. p. 80 supra, note 1.

Legislature felt it within their power to vote and apply to this purpose, and as to the regulations under which the money voted was to be applied.

An acknowledgment of the Lieutenant Governor's message and an expression of gratitude¹ for his generous service in assisting towards a solution of this extremely vital problem, of improving water communication facilities between the Upper and Lower Provinces, was, on 29th February, 1820, delivered to the Lieutenant Governor by a Committee of three Members of the House of Assembly.

Another important resolution drafted at the same time, and receiving the unanimous support of both Houses, was for the appointment of a skillful engineer² to make the necessary surveys, estimate the probable construction cost and ascertain the best plans for developing the proposed project.

No delay was entertained in transforming their resolutions into realities, for a "Civil Engineer's Bill",³ which would supply the necessary authority for

1. Vid. p. 80 supra, note 1.

2. Vid. p. 78 supra, note 1.

3. Cf. "Journals of the House of Assembly, Upper Canada," for Year 1818 et seq.

As a result of the Joint Conference held from 31st October to 3rd November, 1818, and the resolutions adopted by the Joint Committee and passed by both Houses,

the employment of an engineer, was introduced on 16th November, 1818, and signed by the Assembly the next day. An inquiry¹ was addressed immediately to the

on the subject of Improvement of Navigation in the St. Lawrence River, Mr. Durand moved on 14th November, 1818, for leave to bring into the Assembly "a Bill on Monday next for defraying the expenses of surveying the Waters of the River St. Lawrence." The "Civil Engineer's Bill" was read on 16th November, 1818, for the first time; and with the dispensation of the Fifth Rule of the Assembly, was read a second time the same day. It was read for a third time, 17th November, 1818. Mr. Durand then moved "that the Civil Engineer's Bill do now pass (the House of Assembly), and that it be intitl'd 'An Act to authorize the employment of a Civil Engineer to make surveys of the waters of the River Saint Lawrence for the improvement of the Navigation of this Province (Upper Canada), and to provide for the expenses thereof'". The motion was carried and the Bill signed. It was then taken to the Legislative Council by Messrs. Durand and Burnham, as a Committee, who petitioned for the concurrence of the Council. The Council, having other important matters engaging their attention, did not take action thereon until 25th November, 1818, when the following message was sent to the House of Assembly:

"Mr. Speaker: The Honorable the Legislative Council request a conference with the Commons House of Assembly, on the subject matter of a Bill intitl'd 'An Act to provide for the temporary accommodation of the Legislative Council and House of Assembly of this Province,' and have appointed a Committee of two of its Members, who will be ready to meet a Committee of the Commons House of Assembly for that purpose in the Legislative Council Chamber at the rising of the Committee of Conference on the Bill intitl'd 'An Act to authorize the employment of a Civil Engineer to make surveys of the Waters of the River St. Lawrence for the improvement of the Navigation in this Province, and to provide for the expenses thereof.'

Legislative Council Chamber,
25th November, 1818.

Wm. Dummer Powell,
Speaker"

1. Cf. "Journals of the House of Assembly, Upper Canada," for Year 1820, et seq.

On the 24th February, 1820, "Mr. Secretary Hillier

Provincial Agent Resident in London, England, soliciting information as to the terms "on which a Civil Engineer of sufficient abilities for the purpose" could

brought down from His Excellency the Lieutenant-Governor four messages, which he delivered to the Speaker and withdrew." Amongst the messages was the following one relative to the terms necessary for the employment of an Engineer to make a survey of the St. Lawrence:

"P. Maitland.

The Lieutenant-Governor acquaints the House of Assembly that having, in compliance with their request, caused directions to be given to the Provincial Agent Resident in London, to make inquiry of the terms on which a Civil Engineer of sufficient abilities for the purpose would be willing to proceed to this Province to undertake a survey of the waters of the St. Lawrence, he has received from that gentleman a reply, of which a copy is enclosed.

24th February, 1820

P.M."

(Copy)

Ibbotson's Hotel, Vere Street,
London, 31st May, 1819.

Sir:

On the fifteenth instant I had the honor of receiving Major Hillier's letter of the 22nd January last, conveying to me Your Excellency's Commands to inform you on what terms a Civil Engineer of sufficient abilities for the purpose would repair to Upper Canada, and undertake a survey of the River St. Lawrence.

After a diligent inquiry I have had no hesitation in fixing on John Rennie, Esquire, Civil Engineer, as the most proper person to give me the information required. This gentleman is at the head of his profession, is frequently employed by Government, was applied to some time ago by Lord Bathurst upon the subject now in question, and also superintended the building of the Waterloo Bridge.

Mr. Rennie has informed me that a Civil Engineer of sufficient abilities to complete such a difficult and important survey as that of the River St. Lawrence will not probably be found to undertake the work for

be obtained. The Provincial Agent, advised by Mr. John Rennie, Esquire, Civil Engineer, made response that an engineer capable of completing such a difficult survey would probably demand a salary ranging from Twelve Hundred to Two Thousand Pounds Sterling a Year, and in addition all his traveling expenses from England and back again; "his salary to commence from the time he embarks, with the usual advance of from Two to Three Hundred

less than from Twelve Hundred to Two Thousand Pounds Sterling a Year, and his traveling expenses from England and back again; his salary to commence from the time he embarks, with the usual advance of from Two to Three Hundred Pounds.

Mr. Rennie has named Mr. Josias Jessup as a person fully competent to the survey required, but his terms are Six Guineas a day from the day he leaves England until he returns, his expenses out and home, and a moderate allowance for his table. This Gentleman is now surveying for Government at Mr. Rennie's recommendation in the Island of Bermuda, and is likely to return to England in about four months.

Mr. Rennie has also named Mr. Hamilton Fulton as fully qualified for the survey of the St. Lawrence. His terms are Twelve Hundred Pounds a year, and his traveling expenses. This gentleman has lately proceeded from England to make a survey in North Carolina of Mr. Rennie's recommendation, but Mr. Rennie states that Mr. Fulton is at liberty to withdraw himself from that engagement at pleasure.

He received an advance of Three Hundred Pounds on leaving England, and his Address is Messrs. Atkinson's and Fleming's, Merchants, New York.

When I obtain any further information on this subject deserving Your Excellency's notice I shall transmit it without delay.

I have the honor to be,

G. Hillier, Secy.
(A true Copy)

Wm. Halton,
Prov. Agent.

Pounds." He also named Mr. Josias Jessup and Mr. Hamilton Fulton as two engineers who were, in his opinion, fully competent to undertake such a difficult and important survey.

Another bill¹, called the "Survey Bill" and intituled "An Act granting to His Majesty a sum of money for the survey of the Waters of the Saint Lawrence and for other purposes therein mentioned" was passed on 27th November, 1818, by both Houses of Upper Canada and signed by His Excellency the Lieutenant Governor, Sir Peregrine Maitland, K.C.B., for His Majesty. Under this Act a sum of £ 2,000 was appropriated for a survey² of the St. Lawrence River, and for estimates of the cost for the improvement of the navigation.

1. Cf. "Journals of the House of Assembly, Upper Canada," for Year 1818, et seq.

On the 26th November, 1818, Mr. Durand moved "that the Fifth Rule of this House be dispensed with, so far as relates to a Bill granting to His Majesty a sum of money for the survey of the Waters of the River Saint Lawrence, and that he have leave to bring in the same. Which was granted, and the Bill read."

The Bill was read a second and a third time the same day; Mr. Durand then moved "that the Survey Bill do now pass, and that it be intituled 'An Act granting to His Majesty a sum of money for the survey of the Waters of the Saint Lawrence and for other purposes therein mentioned.' Which was carried, and the Bill signed." This Bill was then rushed to the Legislative Council for their concurrence, which was granted. The following day His Excellency the Lieutenant Governor gave his assent in His Majesty's name to the Bill.

2. Cf. "Journals of the House of Assembly of Upper Canada" for the Fourth Session of the Seventh

In 1818 the Governments of Upper and Lower Canada appointed a joint commission¹ to report on the advisability of constructing canals on the St. Lawrence

1. Cf. "Journals of the House of Assembly of Upper Canada" for Year 1821:

Mr. Secretary Hillier, on 3rd April, 1821, delivered to the Assembly the following message with copy of a letter attached:

"P. Maitland, - The Lieutenant-Governor thinks proper to lay before the House of Assembly the enclosed copy of a letter from James Crooks, Esquire, one of the Commissioners, who proceeded to Lower Canada in 1818,

- - - - -
Provincial Parliament - From 7th June, 1819, to 12th July, 1819.

Mr. Nichol, of the Select Committee on Public Accounts, submitted to the House of Assembly the following report:

"To the Honorable the Commons of Upper Canada, in Provincial Parliament assembled:

Your Committee, to whom was referred the investigation of the Public Provincial Accounts, transmitted to the House of Assembly by His Excellency the Lieutenant-Governor during the present Session, respectfully report:

That having examined the same with the utmost attention, they find them to consist of:

(Items enumerated here)

It is necessary to observe that there appears to be an omission of Two Thousand Pounds, appropriated during the last Session, for obtaining a survey of the River St. Lawrence, and estimates for the improvement of navigation. This will increase the authorized demands on the Provincial Treasury for the year 1819 to £ 36,586, 13s., 5d., or say in round numbers £ 36,600.

It is, however, to be observed that of the above deficiency the sum for the survey of the River St. Lawrence may not be called for, and with a view of relieving the Provincial Revenue from the present pressure, it might be desirable to address His Excellency the Lieutenant-Governor, requesting him to suspend the operation of the Bill until funds are provided to meet the expense.

Committee Room, Commons House of Assembly
June 25th, 1819.

Rob. Nichol,
Chairman"

River above Montreal. Several years later other commissions were appointed, the most important one¹ being drafted in 1821 by the Government of Upper Canada; also,

1. Cf. "Journals of the House of Assembly, Upper Canada" for Year 1821 et seq.

A bill appointing the Commissioners was signed on the 14th April, 1821 by the Lieutenant-Governor; and he then addressed "the two Houses with the following most gracious speech:

"Honorable Gentlemen of the Legislative Council, and Gentlemen of the House of Assembly:

The bill for appointing Commissioners to ascertain and report on the improvements which can be effected in the internal navigation may be considered as the commencement of an important undertaking eminently calculated to advance the prosperity and greatness of Upper Canada."

- - - - -
to meet other Commissioners on the part of that Province, to confer on the subject of the improvement of the navigation of the river St. Lawrence, which Commissioners were appointed in consequence of a joint address of the Legislative Council and House of Assembly of the 10th March, 1818, and their report laid before the Legislature in the ensuing session.

Government House, 2nd April, 1821

P.M."

(Copy)

Sir,- I beg leave to enclose a letter addressed to me by the Private Secretary of His Honor Mr. President Smith when in the administration of the Government of this Province, and dated 6th July, 1818. In consequence of which the Honorable Thomas Clark and myself proceeded to Quebec, and executed the duty mentioned in the said letter, and made our report to His Excellency the present Lieutenant Governor of this Province, but have never received any allowance of any sort therefor. May I request the favour of you, to lay the same before His Excellency at your convenience, in the humble hope that he will be pleased to take such measures as will obtain us the allowance usual in such cases.

I am very respectfully, Sir, your most obedient servant.

To Major Hillier, etc.

James Crooks"

(A true copy), Geo. Hillier.

in 1833, the Government of Lower Canada selected a group¹ of men for a similar purpose. At the time the Union of Canadian Provinces was being effected, it was a distinctly recognizable fact that the encouragement of trade between the two Canadas, by providing communication facilities in the nature of a navigable waterway between them for lake-going vessels, would inevitably bring about a great harmonization of interests of the

1. Cf. "Journals of the House of Assembly, Lower Canada." 3rd Session, 14th Parliament. 1832-33. Vol. 42.

Mr. Nichol, on the 13th April, 1821, moved that the House of Assembly resolve itself into a Committee of Supply and give consideration to His Excellency's messages dated the 3rd and 5th of April, 1818, respectively.

Mr. Robinson, Chairman of the Committee, later that same day reported that several resolutions had been adopted, among which was the following:

"Resolved - That it is the opinion of this House that to enable His Majesty to remunerate the Honorable Thomas Clark and James Crooks, Esquires, for their services as commissioners for conferring with the commissioners on the part of Lower Canada, respecting the improvement of the inland navigation there be granted the sum of two hundred pounds: one hundred pounds to be paid to each of the said commissioners."

The same day the Attorney-General and Mr. Wilmot were ordered to prepare a bill for appropriating the sums voted as reimbursement to the Canal Commissioners for service rendered. This bill was read three times on the 14th April, 1821, under permission provided by dispensation of the Fifth Rule of the Assembly, and, after being intituled "An Act to provide for the remuneration and reimbursement of certain persons mentioned therein", was signed. It was then sent to the Council for their concurrence, which they granted. His Excellency the Lieutenant-Governor then gave his assent, by signing, in His Majesty's name.

two provinces than would any legislative Act of Parliament.

Lord Durham, in 1839, directed Lieutenant-Colonel George Phillpotts¹, of the Royal Engineers to investigate and report upon the canal navigation of the two provinces. Phillpotts submitted two reports², one in 1839 and the other in 1840. In both reports he recommended the enlargement of all the canals then constructed between tidewater and Lake Erie; and he suggested as a "standard in size" the lock which had been used in the then partially completed Cornwall Canal³, the dimensions of which were 200 feet in length, 55 feet in width and with 9 feet of water over the sills. However, his recommendations were not acted upon in their entirety until after the Union, when building of canals on the

1. Phillpotts had the rank of Captain in the Royal Engineers.

2. Patton, op. cit., Vol. X, p. 505.

3. Cf. "Report of the Board of Works," Montreal, December, 1844, laid before the Legislative Assembly, February, 1845. Printed by Desbarats and Derbishire, Queen's Printer, Montreal, 1845. p. 6. Hamilton H. Killaly, President, Board of Works, writes: "To avoid these serious (Long Sault Rapids), indeed they may more properly be styled insurmountable obstacles to the trade, the Cornwall Canal was commenced and to a great extent constructed under the Commissioners appointed previous to the establishment of the Board of Works. Under the control of the latter it has been completed."

St. Lawrence river was vigorously pushed forward.¹

With the same vigor as the united provinces had attempted the improvements of water communication between Lake Erie and tidewater at Three Rivers, so, too, did the provinces after Confederation in 1867 engage their attention with the development of navigation facilities of the inland waterways. Commercial motives had almost superseded military motives by 1867 as the principal incentives for the construction of new and the enlargement of existing canals. Improvement of Canadian canals was imperative, if the system of waterway facilities were to keep stride with the tremendous growth of lake traffic and the increase in the size of Vessels operating thereupon.²

As a preliminary to the commencement of this work,

1. Report of the Board of Works, Montreal, Dec., 1844. Laid before the Legislative Assembly, February, 1845. pp. 4-16 and 27. Cf. also Ibid, Appendix to Report: Letters B,D,E,F,G,K,L,M,N,O,P,R,S,T,U,V and W; and also see United States Senate Document No. 114, 67th Congress, 2nd Session. p. 15 et seq.

2. Cf. Commissioner of Public Works Report for the fiscal year ending 30th June, 1861, Ottawa: Pr. by I. B. Taylor. 1862. p. 9.

"First,- With regard to the Welland Canal. Although its tonnage capacity is nearly twice that of the Erie Canal enlargement, still more than one-third of the steam vessels which navigate the upper lakes are unable to pass through it. The large and profitable class of propellers, which now form the favorite means of transport on lake Erie, cannot descend into Lake Ontario."

the Confederated Government in 1870 appointed a canal commission,¹ which, after an investigation, submitted

1. Cf. General Report of the Minister of Public Works for the Fiscal year ending 30th June, 1871. Ottawa: Pr. by I. B. Taylor, 1872. pp. 3-4.

"THE CANAL COMMISSION:- During the fiscal year a commission issued under the Great Seal of Canada, dated the 16th November, 1870, authorizing a full and complete enquiry and report upon the works and improvements necessary to make such a thorough and comprehensive improvement of the canal system of Canada, as might meet the growing traffic and commerce of the dominion, and afford increased facilities for carrying to the seaboard, through Canadian waters, the products of the Great Western Country.

The Commissioners were instructed to institute such an enquiry as would embrace the whole subject in all its bearings, as well from a commercial as from an engineering point of view; and especially to enquire into the following public works and improvements:-

1. The Welland Canal and the enlargement thereof.
2. The St. Lawrence Canals and their enlargement.
3. The deepening of the channels through the rapids of the River St. Lawrence.

4. The deepening of the said river in its most shallow parts, between the cities of Montreal and Quebec.

5. The Rideau Canal and its improvement, and the development of trade through the same.

6. The construction of a canal at Sault Ste. Marie between Lakes Superior and Huron.

7. The construction of a canal between the St. Lawrence, at Caughnawaga, and Lake Champlain.

8. The improvement of the River Richelieu and Lake Champlain line of canals.

9. The completion of the Montreal and Lake Huron system of navigation, via the Ottawa and French Rivers.

10. The construction of the Georgian Bay Canal, to connect the Georgian Bay with Lake Ontario.

11. The construction of a canal in the Township of Murray, through the neck of land lying between Lake Ontario and the Bay of Quinté.

12. The construction of a canal through the Isthmus dividing the Bay of Fundy from the Gulf of St. Lawrence at Bay Verte.

a report in 1871 advising a uniform enlargement of the navigable waters from Lake Erie to tidewater at

The Commissioners were further instructed to enquire which of the above works should be constructed, and in what order they should be respectively proceeded with; what dimensions and depths should be given them, and the probable cost of their construction.

On the 25th November, 1870, the Commission held its first sitting at Ottawa, and on the 24th February following, presented a report, being a letter addressed to the Honorable The Secretary of State, which was laid before Parliament, then in session, by order of Your Excellency.

In this report of the Canal Commission it was recommended:-

That as regards the proper scale of navigation for the main line of water communication, from Lake Superior to tide-water, there should be one uniform size of lock and canal throughout: the locks to be 270 feet in length of chamber between the gates, and forty-five feet in width, having twelve feet of clear draught from the mitre sills; the bottom of the canals to be sunk one foot below the mitre sills of the locks, and to have a width throughout of not less than 100 feet, to admit of vessels passing through with perfect ease in any part of the canal.

That the locks on the Bay Verte Canal be 270 feet in length of chamber between the gates, and forty-five feet in width, having fifteen feet draught of water on the mitre sills.

That the locks of the Ottawa canals be 200 feet in length of chamber between the gates, and forty-five feet in width, having nine feet of draught over the mitre sills.

That the locks on the Chambly Canal be 200 feet in length of chamber between the gates, and forty-five feet in width, having such draught over the mitre sills, not exceeding nine feet, as the channel in the Richelieu River will afford.

The Commissioners distinguish the works required to improve and increase the facilities of inland navigation, according to their relative importance and urgency, into four classes.

The following works of the first class, they estimate at a total cost of \$19,170,000:-

Three Rivers. The recommendation¹ of the commission indicated the use of canal locks 270 feet long, 45 feet wide, and with a 12 foot depth of water on the sills. Plans for the enlargement of existing works

1. Vid. p. 92 supra, note 1.

- - - - -
The Sault Ste. Marie Canal.

The raising of the lock walls, waste weirs, and banks of the Welland Canal, on the present line from Allanburgh to Port Dalhousie, in a permanent manner, to admit the passage of vessels drawing twelve feet of water.

The enlargement of the Welland Canal on the scale adopted for that work.

The Ottawa Canal improvements from Ottawa city to Lachine, and the enlargement of the Chambly Canal, on the scale adopted for them.

Deepening of the navigable channel in the River St. Lawrence, between Quebec and Montreal, to twenty-two feet draught at low water.

The construction of the Bay Verte Canal, on the scale adopted for it.

The enlargement of the St. Lawrence Canals to the same scale as the Welland. At the lower entrance of the Lachine Canal, another set of locks to be constructed, with seventeen feet of water on the mitre sills, forming a second line of communication between the Montreal Harbor, and the upper (No. 2) basin of the canal.

The improvement of the channel in the River St. Lawrence, above Montreal, by removing all obstructions in the river and lakes, so as to give fourteen feet of water throughout.

Acting on these recommendations, sums were placed in the estimates voted by Parliament during last session, to enable the Government to extend the work then building on the Carillon and Grenville Canals to the capacity suggested by the Commission; to continue the survey and works on the Welland Canal; to improve the channel of the River St. Lawrence; and to complete the survey of the Sault Ste. Marie Canal."

to conform with the suggested size were approved¹ in 1873, and the work was immediately begun.

However, after work had been commenced, leading business men very comprehensively foresaw the inadequacy of a navigable route with only 12 feet of water at its minimum passages. Consequently, in 1874, an organized movement² was engendered in the interest of further improvement in inland navigation facilities; strong representations were made to the Government to increase the depth of the canals to 14 feet instead of 12 feet, as recommended by the commission. In 1875 this request was granted, and orders issued for the permanent structures of those works that had not been placed under contract to be built to the enlarged scale.

The St. Lawrence River Canals

The canals on the River St. Lawrence already constructed by the Royal Engineers of the British forces then occupying the territory were mainly for military purposes. They were four in number, and were built on the St. Lawrence around the upper and lower of the

1. Cf. General Report of the Minister of Public Works for the year ending 30th June, 1873 and 1874. pp. 3-10.

2. Cf. "Journals of the Senate," Dominion of Canada, for the year 1874 et seq.

three rapids between Lake St. Francis and Lake St. Louis. These canals were later surmounted by the Beauharnois Canal, construction of which was begun in 1842.

Work on the four canals mentioned above was begun in 1779 by Capt. Twiss¹, a member of the Royal Engineers and commanding officer of that Corps, who, in accordance with instructions from Governor Haldimand, was directing the construction operations. Under orders from Haldimand, engineers designed these canals² "primarily for facilitating the transport of military stores

1. Douglas Brymner, Canadian Archivist, "Report on Canadian Archives (Being an Appendix to Report of the Minister of Agriculture)" for 1886. (Printed by Maclean, Roger & Co., Wellington Street, Ottawa, 1887) p. xxi. Also vid. Sessional Papers Vol. XX, No. 11, (1887) of the 1st Sess. of the 6th Parliament of the Dominion of Canada; Sess. Paper No. 12. And also vid. Patton, op. cit., p. 506; and Senate Doc. No. 114, p. 20.

2. "The report of the Commissioner of Public Works for the year ending 30th June, 1867, being the last of the old Province of Canada," writes Brymner (op. cit., 1886, pp. xx-xxi), "contains a general account of the most important public works of Upper and Lower Canada, previous to the constitutional change which was about to take place. At page 566 of this report, is the following account of certain canals, in these words:

'Prior to the construction of the Beauharnois canal, the navigation between Lakes St. Louis and St. Francis was effected by means of short canal locks at the Cascades, Cedars, and Coteau du Lac.

and munitions, but with the secondary object of assisting the merchants."¹

The so-called "old French canal" situated at the Rapids of Faucille, which is but a short distance above Cascades Point, is the first; it had a length of four hundred feet, and a width of six feet, and was equipped with one lock². The second canal, of similar width

1. Brymner, op. cit., 1886, p. xxi.

2. Vid. p. 96 supra, note 2.

'Prior to 1804, they were as follows, viz.:

		Length of canal.	Width of lock.
At the Cascades - Old French canal and lock at the Faucille about		400 ft.	6 ft.
do	do - Trou du Mou- lin	200 "	6 "
do	do - Old lock at Split Rock	200 "	6 "
At Coteau du Lac	- Canal and two locks	900 "	7 "

'These canals had a depth of $2\frac{1}{2}$ feet on the mitre sills of the locks, which were of stone, and were designed for the passage of boats capable of carrying from 30 to 40 barrels of flour.

'In 1804, the locks at "Split Rock" and "Coteau du Lac" were partly rebuilt, and a new canal, about half a mile in length, with 3 locks, 6 feet in width between the quion posts of the gates, was constructed at the foot of the Cascades, instead of the old French locks at the "Faucille" and the "Trou du Moulin."

"The error committed in calling these "French" locks, arose from the Department of Public Works having been obliged to rely for information on local tradition, no reference being possible at the time to documentary evidence."

but only two hundred feet long, was located at Trou du Moulin near a mill owned by Mr. Longueuil. It was provided with a lock.¹ At Split Rock a natural opening leading through the rocky shore afforded the necessary passage-way for a canal, known as Split Rock.² This avenue was two hundred feet long and was provided with one lock having a width of six feet. The sides of the lock were formed by the natural walls of the channel. The cutting at Coteau du Lac³ was the most important

1. Cf. Brymner, op. cit., 1886, p. xxii: "Writing on the 2nd December, 1779, to Haldimand, Twiss says of Coteau du Lac:- 'A little above this mill is one of the greatest obstructions in the whole rapids, which I conceive can easily be removed, at least I purpose to try.' "

2. Vid. p. 96 supra, note 2.

3. "On the 5th of June, 1780," says Brymner (op. cit., loc. cit.), "he (Captain Twiss) thus writing to Haldimand:-

'Late last night I returned from visiting the Coteau du Lac, where I found everything pushing forward with great industry, and as the return of Sir John Johnson will enable us to increase the number of our workmen, I am in hopes to complete the locks for passing bateaux by the end of September. The work already done has enabled me to judge far more correctly of this situation than formerly, and has induced me to change the plan of the workmanship, and instead of having the sides of timber to build them of masonry. I sincerely wish your Excellency could see this post, as I am persuaded it will be formed into locks as useful to navigation as any in the world.

'The attempt made last winter to improve the passage thro' the Bisson (Buisson), a cloven rock, has succeeded only in part, and has since been hurt by the conductor throwing in loose stones, with a good intention, but bad judgment - these stones must be removed and a small frame of oak introduced in their place.

to be made as well as the last of the four earlier canals. The canal had three locks¹ and was nine hundred feet long with a maximum width of seven feet.

This series of early canals between Lakes St. Francis and St. Louis, small toy-like things in a way, when compared with the modern canal of today, but of invaluable usefulness not only to the military authorities but alike to the enterprising merchants busily engaged in commercial activities at that time, was approximately seventeen hundred feet in length², and equipped with five stone locks, each of which was six feet in width, with the exception of the three situated

1. Cf. Brymner, op. cit., 1886, p. xxiii: "At the Coteau du Lac, there were originally three locks, not two as stated in the report on Public Works already referred to." Vid. the extract taken from the report on Public Works as published by Brymner and shown in this thesis in footnote 2, p. 96 supra.

2. Vid. p. 96 supra, note 2.

Drawing a sketch for this purpose and making the necessary arrangement that the iron work for the flood gates at Coteau du Lac may be made as soon as wanted will detain me, &c.' (B. 154, p. 266.)" Again we learn further about these canals from Brymner (op. cit., loc. cit.) who reports that "on the 15th February, 1781, he (Captain Twiss) writes:

'We are just returned from visiting the Coteau du Lac, &c., the canal there is very complete and in good order, and so situated that it cannot possibly receive the least damage from the ice, but many difficulties still remain in the navigation about the Cedars, where a little labor properly conducted would be of great advantage to the public.' (B. 154, p. 316.)"

at Coteau du Lac, the maximum width of which was seven feet. The locks each had a depth of two and a half feet on the mitre sills¹ designed especially to supply water communication facilities to small boats, canoes, and bateaux carrying from thirty to forty barrels of flour.

The rock-cutting in the construction of these canals was performed under directions from Captain Twiss², by a group of Cornish miners³, who, because

1. Vid. p. 96 supra, note 2

2. Twiss Wrote a letter to Haldimand on the 3rd December, 1781, according to Brymner (op. cit., 1886, p. xxiii) in which "he says:

'I minutely examined the progress made in our plan towards improving the navigation of the Cascades and the Cedars, and all difficulties considered, we are as forward as could be expected, but the season will not permit us to proceed except in enlarging and deepening the passage at the Split Rock, and in providing timber for the spring.' (B. 154, pp. 353, 354.)"

3. "The report of the work done during the season of 1782," writes Brymner (op. cit., 1886, p. xxiii), "is given in a letter from Twiss, dated the 19th September of that year.

'On the 15th inst., Capt. Maurer and I left Montreal, and the same day examined the progress of the works at the Cascades, &c.

'At the Cascades the sides of the locks (are) carried out to their full length, and two pairs of gates hang, which are all the rapid requires; a part of the floor and the sluices still remain to finish, but I apprehend loaded bateaux will certainly pass in six or seven days, tho' after that a great quantity of stone must be brought and laid outside to secure this work against the ice.

'At the Little Rocks, six of the Cornish miners have been employed, where, by their great abilities and industry, they will in a few days open a commodious

of "their abilities and industry" were especially brought from England for that particularly difficult task.

Haldimand was fully alive to the importance of these canals not from the mere fact that they provided ample and expeditious means for the transportation of military supplies, but also because of the great inherent incentive furnished that would encourage the commercial development of the country. Recognizing how advantageously they might be used in this respect, he issued instructions to Captain Twiss that he hold a

channel close to the shore, so that we all think the loaded bateaux will pass without difficulty and without the expense of flood gates.

'These miners have also been at work on the canal which avoids the Trou, but nothing can be completed here so as to be useful this season. The work at the Bisson (Buisson) is in the same predicament, and I suppose during the winter to employ Mr. Muchmore to procure such timber as may be necessary for both these services, and then I think next summer, with the assistance of about forty workmen for two months, the navigation at both these places will be quite easy, yet still a thousand little improvements can be made, and indeed are necessary at almost every point, and as it appears to us beneficial to the transport to begin this service at present, I have ordered four miners to proceed next week to the Long Sault in order to blow a rock much complained of there, and on their return they are to attempt the improvement of several places between the Coteau du Lac and Lake St. Francis.

'Nothing can be done at the Coteau du Lac since Your Excellency visited that post, except pointing the walls of the locks, which for want of good workmen are not yet so waterproof as they ought to be, but they shall be attended to.' (B. 154, pp. 407-8.)"

conference¹ with the business men who availed themselves of the then existing water communication system. Accordingly, on February 19, 1781, a meeting was held in which the attending merchants in common favor of the arrangement acquiesced in the waterways development scheme broached by the Government.

At first the toll charge was only ten shillings² by mutual agreement, in the year 1781, between the

1. "Haldimand," says Brymner (op. cit., 1886, pp. xxii-xxiii), "seeing that these canals would be recognized as of great advantage to the business of the merchants, gave instructions to Twiss to call a meeting, the result of which is stated in the letter from Twiss of the 19th February, 1781.

'At a meeting of the merchants whose goods pass the Coteau du Lac, I informed them it was Your Excellency's intention to persevere in improving the navigation to Carleton Island, but as their trade would always reap the advantage of such improvements, you thought it unjust the whole expense should fall on the Government, and therefore wished that each bateau belonging to each private person should pay a certain toll, whose amount should always be laid out in the said improvements. The justice of this was allowed, and they all voluntarily and with great cheerfulness consented to pay ten shillings currency for each bateau which passes the new locks..... We imagine (the toll) will produce from £ 120 to £ 160 currency per annum, so that I hope all improvements on this navigation will fall very easy on Government.' (B. 154, pp. 318, 319.)"

2. Vid. Twiss' letter of February 19, 1781, in footnote 1, supra. Brymner (op. cit., 1886, p. xxiii says: "The amount of toll during the season of 1781 was, according to a letter from Twiss of the 3rd of December:

263 bateaux.....	10s.	£ 131.10.00
2 canoes and 1 boat at	5s.	0.15.00
		<u>£ 132.05.00"</u>

Government and the merchants of the country. Some two years later it was contemplated by Captain Twiss that upon completion of the Split Rock canal lock the toll for each bateau be increased from ten to twenty-five shillings,¹ except on those bateaux in the service of the king, which were at all times to pass free.

1. "On the 22nd August, 1783, Captain Twiss reports the progress of the work during the season in these terms:-

'On Wednesday morning I left Montreal and visited (sic) the progress of the several canals, which fully answer my expectations, and I can assure Your Excellency that the whole will be completed about the 30th September, when I purpose to discharge all the workmen employed there. In the meantime some little assistance will be required from expert miners, and, therefore, I write by this post to Lieut. Hockings to direct him to send here two such as soon as possible.

'The canal at Mons. Longueuil's mill I have directed to be finished, so as best to answer the king's service, and, at the same time, have insisted on Mons. Longueuil paying a part of the expenses.

'The money received this year at the several locks is as follows:-

The Coteau du Lac	£ 127.00.00
Between the Cascades	
and the Trou	46.15.00
	<hr/> £ 173.15.00

'And when the lock at the Split Rock is finished, the toll upon each bateau will be 25 shillings. Now supposing the private trade only continues as for two years past, which was about 260 bateaux each year, the sum received annually will amount to £ 325 currency, which sum I think cannot fail of paying all persons necessary to be employed, as well as all expenses for keeping the whole in the best repair possible, and whatever boats the king's service requires will, of course, always pass free.' (B. 154, pp. 453-4.)"

The total number of bateaux that passed through the canal system annually was about two hundred and sixty.

No sooner were these canals completed than proposals for their enlargement were forthcoming so that the accommodating capacity thereof could keep pace with the enhanced and continually growing volume of commercial trade then utilizing these facilities. Colonel Gother Mann of the Royal Engineers was appointed, in 1800, to make an investigation and report regarding the advisability of further improvement. He recommended¹ that the Government undertake the enlargement of the opening at the Coteau du Lac Canal gates from their then present width to nine feet six inches. A similar recommendation was made for enlargement of the opening of the gates at Split Rock; and he further recommended that the breadth of the canals be increased an additional two feet, and that the depth of the whole system be increased by about one foot six inches. The locks of the canals, he suggested, should be widened

1. Cf. Brymner, op. cit., 1886, p. xxiv: "..... Colonel Mann, in his report dated in December, 1800, recommended certain changes to be made in the Canals. He proposed to enlarge the opening of the gates at the Coteau du Lac to 9 feet 6 inches; to give an additional breadth of two feet to the canals and four feet to the locks and to deepen the whole one foot six inches. A similar enlargement was recommended for the canal at the Split Rock."

beyond those of the present structure by another four feet and, as in the case of the canals, given a further depth of one foot six inches.

Much trouble was experienced in the operation of these canals, for each spring the engineers were obliged to make extensive repairs of damage caused by the erosive action of the ice, particularly to the two lower canals which were incapacitated during the winter season.¹ Because of this continual occurrence of seasonal damage from ice to the canals² situated at the Mill Rapid and the Cascades, and, as a consequential recurrence, the heavy annual expenditure of public money for maintenance, Col. Mann strongly advised that the Government abandon the present locations and construct one new canal via another nearby route, thus avoiding both of the rapids around which the other two canals were originally built.

He suggested³ that the newly contemplated canal should be fifteen hundred feet long and ten feet wide, and, to overcome a difference of thirteen feet eight

1. Vid. p. 107 *infra*, note 3.

2. Cf. Brymner, *op. cit.*, *loc. cit.*, "For the canals at the Mill Rapid and the Cascades, however, owing to their bad condition, to their liability to damage from ice, and to the consequent large annual expence for their maintenance, he proposed the construction of one canal to avoid both rapids."

3. Cf. Brymner, *op. cit.*, 1886, p. xxiv-xxv. ' "At

inches between the water level of the Ottawa River and that of the Cataragui (or St. Lawrence), it should be provided with three locks. The dimensions of each lock to be thusly: one hundred and twenty feet long, twenty feet wide, and presumably of a depth of from four to five feet. The proposed length for each lock would be sufficient to accommodate six boats or bateaux at a time and permit their passage with comparative ease.

The cost of construction of this newly proposed canal, he estimated, would be approximately £ 2,871 Sterling; against this cost he anticipated the probability of writing off annually an amount of £ 600, which, it was his opinion, could undoubtedly be procured from

about nine hundred yars, he (Colonel Mann) says, above the Cascades, on the streams leading to the Grand or Ottawa River, and at nearly the same distance above the Mill Rapid on the Cataragui River, a neck of land is formed, which presents a favorable situation for a permanent canal. The Length across is fifteen hundred feet in a straight line on the course which I should propose the canal to run. At the extremities of the section line the waters of the Cataragui or St. Lawrence were thirteen feet eight inches higher than those of the Ottawa River. I propose to sink the canal three feet below the surface of the waters as they were when the level was taken, at which period they were uncommonly low. This will be more than sufficient to float the largest boats and will allow for a still further decrease of the rivers. The canal should be ten feet wide, and the locks twenty feet wide, and if they are each 120 feet long will allow six boats to pass at a time. I suppose that three locks will be required, &c." "

tolls. The revenue received from this source was unremittently increasing as each year of operation elapsed. This secular trend of earnings continued its upward movement; and in 1799 returns were very encouraging, for in that year the receipts from toll charges had more than doubled what they had been in 1795.¹

Persuant to the recommendation of Colonel Mamm, in 1800, that the old canal system at the Mill Rapid and the Cascades be abandoned, construction of a new canal according to the proposed plan² was shortly thereafter begun. The new canal was not completed until the latter part of 1805, the old system³ being kept in operation during the period required to construct the new

1. "The total expense," writes Brymner (op. cit., 1886, p. xxv), "he estimates, would be £ 2,871; towards defraying this he takes £ 600 as the annual amount received from tolls, the revenue from this source increasing steadily, the amount paid by the trade in 1799 having exceeded that in any previous year, and being more than double what it was in 1795. (C. 38, pp. 2-7.)"

2. Cf. Brymner, op. cit., 1886, p. xxv. "The original plan, with profile, accompanies the report from which these extracts have been made."

3. "The yearly reports made by the engineers of the progress of the work and the accounts of expenditure by the Commissioner-General, show that the work was not completed till 1805, till which time the old locks were used, as is proved by a report dated 24th April, 1805, signed 'John By, Lt., Royal Engrs.,' which gives an account of the damage done during the winter at the Cascades, Mill Rapids, and Split Rock, with an estimate of the repairs necessary to enable bateaux to pass through during the next season of navigation. On

one, in order not to cause any interruption to navigation. This canal, evidences¹ of which still exist, has long ceased to serve as a convenient avenue through which commerce from the West may flow in its movement to the seaboard. The almost obliterated remains² of the other canals still reveal the earlier efforts to improve navigation on the St. Lawrence River.

A great amount of appreciative interest is attached

1. Cf. Brymner, op. cit., loc. cit.; "The canal still exists; the masonry, however, is showing signs of giving way, but the rock cutting appears to be almost unchanged. The gates are no longer on the locks, and owing to their absence, the waters rushing through have made a shoal at the Ottawa end, which impedes navigation. Preparatory to improving the channel, a dam has been built nearly mid-way between the extremities of the canal, to stop the flow of water by which the silting was caused."

2. Cf. Brymner, op. cit., loc. cit., "The remains of the other canals are perfectly visible." Cf. also Sessional Papers (Canada) No. 12, 1887, Vol. XX No. 11.

the 16th January, 1804, (endorsed 1805, which is the correct date) Captain Bruyeres, R.E., gives a detailed account of the progress of the work in the new canal (C. 38, pp. 68-70) and on the 7th March (pp. 72-74) states the expense already incurred to have been

Original estimate (sic.)	£ 2,521.09.09 $\frac{1}{4}$
Sum remaining to accomplish work	2,881.00.00
Sum proposed to continue the work	359.10.02 $\frac{1}{2}$
in 1805 (details given)	831.13.09
Excess	£ 472.03.06 $\frac{1}{2}$

The additional expenditure was due to the difficulty encountered in the rock cutting." Cf. also Patton, op. cit., p. 508, and Canadian Sessional Paper (No. 12) 1887, Vol. XX No. 11.

to the history of the earlier canals¹; for in their development and occasional enlargement from time to time throughout the first few decades of the nineteenth century lay the germ of the canal system now in existence.

The development of these canals was not without opposition, however, as will be seen by referring to letters written by Sir James Carmichael Smyth to General Mann regarding Lieut.-Colonel By's proposals.² Sir James considered the project of little importance commercially, his chief interest being from a military point of view. He felt that a canal of 20 foot breadth would be ample to permit the passage of gun boats and would pay for the cost of construction. In fact, he expressed himself as of the opinion that impediments to navigation were more desirable than improvements, as the former would hinder any surprise attack from the enemy in America.

The Sault Ste. Marie Canal

The history of the construction of a canal on the Canadian side of the Sault Ste. Marie dates from the last decade of the eighteenth century in which period

1. "Much of the interest in the history of these canals," says Brymner (op. cit., 1886, p. xxix) "lies in the fact that they were the germ of the canal system now in existence."

2. Brymner, op. cit., 1886, Note D, p. 70.

a private company built one for its own use. While the Royal Engineers of the Imperial Forces occupying Lower Canada engaged their undivided attention with the problem of the development¹ of water communication in the eastern part of the country, primarily for the purpose of transporting military supplies to the forts built along the western frontier, the improvement of navigation on the inland waterways of the "Great West" territory was left entirely to a private enterprise whose chief concern was to provide facilities sufficient to permit an unimpeded passage for its loaded canoes and bateaux.

In order that the reader may better comprehend the almost insuperable problems of transportation that confronted these early adventurers within the North-West territory, a brief description of inland navigation and the method used to transport their goods to and from Montreal, outlined by Messrs. Benjamin and Joseph Frobisher of Montreal in their Memorial, bearing the date

1. Cf. Brymner, op. cit., 1889, p. xi. "The collection of which I now speak covers a period from about 1785 to 1870. Then there are reports of expeditions of the North-West,, documents relating to the construction of the canals by the Imperial Governments; very complete reports of the progress in Canada of the Royal Engineers;"

of 4th October, 1784, to General Haldimand, is given hereunder in the exact language of these gentlemen.¹

"The Inland Navigation from Montreal, by which the North-West business is carried on, is perhaps the most extensive of any in the known World, but is only practicable for Canoes on account of the great number of Carrying places. To give Your Excellency some Idea of which, there are upwards of ninety from Montreal to Lake du Bois only, and many of them very long ones.

"Two setts (sic.) of men are employed in this business, making together upwards of 500; one half of which are occupied in the transport of Goods from Montreal to the Grand Portage, in Canoes of about Four Tons Burthen, Navigated by 8 to 10 men, and the other half are employed to take such goods forward to every Post in the interior Country to the extent of 1,000 to 2,000 miles and upwards, from Lake Superior, in Canoes of about one and a half ton Burthen, made expressly for the inland service, and navigated by 4 to 5 men only, according to the places of their destination."

The North-West Company², a small group of business associates carrying on a fur and merchandise trade

1. Cf. Brymner, op. cit., 1890. Note C. No. 3, p. 51.

2. G. C. Davidson, "The North West Company," in University of California Publications, (1918), Vol. VII, p. 12. "The Stock of the North West Company as founded in 1783-1784 was divided into sixteen shares, no capital being deposited." Also Vid. Brymner, op. cit., 1886, p. xxvi. "..... In 1798 the partners of the North West Company disagreed, and a second company was formed. In 1799 the original North West Company applied for a grant of land at the Sault Ste. Marie for a trading post, an application opposed by Messrs. Phyn, Inglis & Co., the London Agents for the X. Y. Company." The X. Y. Company formed in 1795, and led by Alexander Mackenzie, was "an offshoot of the North West Company" and existed until 1804, when a coalition between it

with the Indians of the Northwestern territory, encountered, at the falls and rapids in the St. Mary's River, the connecting link between Lakes Superior and Huron, a physical obstruction set up by Nature and impeding an otherwise freely navigable waterway from the western shore of Lake Superior eastward as far as the outlet of Lake Erie. To overcome this insuperable impediment¹ to navigation, the Company in 1797 built a canal across the portage. This canal was about 2,580 feet in length, having a lock 38 feet long, 8 feet 9 inches wide, with a depth of 9 feet of water.²

1. Cf. Brymner, op. cit., 1886. p. xxv.

2. Vid. p. 120 infra. Letter from Captain Bruyeres dated 10th September, 1802. Cf. also Brymner, op. cit., 1886, p. xxix.

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and the North West Company was formed. Vid. Chester Martin, "The Red River Settlement," in "Canada and Its Provinces," 1914, Vol. XIX, p. 16 et seq. The North West Company of Montreal merged with the Hudson's Bay Company on March 26, 1921. Vid. Davidson, op. cit., loc. cit. Cf. Brymner, op. cit., loc. cit., "The Duke of Portland, writing on the 13th March, 1800, to Lieut.-General Hunter, agreed with Messrs. Phyn, Inglis & Co., that the possession by the North West Company would be highly injurious to others engaged in that (the fur) trade. His Grace adds: 'I am strongly inclined to be of the opinion that it must be very much for the benefit of the fur trade, that about four or five leagues, or perhaps the whole of the strait in question, should be forever retained in the hands of the Crown.' (C. 363, pp. 4 to 6). In 1802, the disputes between the two companies were increasing in virulence. Messrs. McTavish, Frobisher & Co., on behalf of the North-West Company, applied in April of that year for the sole use of their improvements on the north side of the Sault Ste. Marie, 'without giving sanction to a monopoly that might improperly affect the interests of others.' "

According to the Canadian Archivist, Mr. Douglas Brymner, no records of the works, due to its being a private undertaking, are to be found in any public department, Canadian or British.¹ The only evidence on the subject is that obtained solely from the documents relative to the disputes between the rival North-West Companies, and because of this fact Mr. Brymner has given an abstract of the documents relating to their respective claims.

So concisely has the Archivist followed the chronological events appertaining to the existence and use of a canal at St. Mary's Falls as early as the year 1797, that, rather than recount it in the form of a narrative, it is deemed appropriate, although more space will thus be occupied, to reproduce in this work extracts from his reports² in so far as they concern a canal at that point.

"It has already been stated, that in 1798 the partners of the North-West Company disagreed, and a second company was formed. In 1799 the original North-West Company applied for a grant of land at the Sault Ste. Marie for a trading post, an application opposed by

1. Cf. Brymner, op. cit., 1886, pp. xxiv-xxv.

2. Cf. Brymner, op. cit., 1886, pp. xxv-xxix.
And also Ibid., 1889, pp. xxxvii-xxxviii.

Messrs. Phyn, Inglis & Co., the London Agents for the X. Y. Company. The Duke of Portland, writing on the 13th March, 1800, to Lieut.-General Hunter, agreed with Messrs. Phyn, Inglis & Co., that the possession by the North West Company of a tract of land on the Falls of the Strait of St. Mary would be highly injurious to others engaged in that (the fur) trade. His Grace adds:- 'I am strongly inclined to the opinion that it must be very much for the benefit of the fur trade, that about four or five leagues, or perhaps the whole of the strait in question, should be forever retained in the hands of the Crown.' (C. 363, pp. 4 to 6). In 1802, the disputes between the two companies were increasing in virulence. Messrs. McTavish, Frobisher & Co., on behalf of the North-West Company, applied in April of that year for the sole use of their improvements on the north side of the Sault Ste. Marie, 'without giving sanction to a monopoly that might improperly effect the interests of others' (C. 363, p. 10). A quotation from their Memorial will show what these improvements were. After setting out the efforts they had made to render the Indian trade free and independent of the American government, by exploring and opening communications with the interior

country through British territory, Messrs. McTabish, Frobisher & Co. continue:

'That in furtherance of the same view and in contemplating the advantages of a free and unobstructed passage between the Lakes Huron and Superior, your memorialists, in the year 1797, caused a proper survey to be made on the British side of the Falls of St. Mary; the sixth part of the expense of which, amounting to about forty-five pounds, was defrayed by the house of Messrs. Forsyth, Richardson & Co.

'That in consequence of the report made of the said survey, your memorialists have since that period actually cut a road forty-five feet wide across the carrying place, and opened a canal, upwards of three thousand feet in length, with a lock which raises the water nine feet, and have also erected thereon a saw-mill, storehouses and other necessary buildings for facilitating the navigation of said canal.' (C. 363, pp. 8,9).

"They then give an account of the efforts they had made further to secure communication, by purchasing land from the Indians; all improvements at Kaministiquia, &c.; the great cost of the canal, increased by annual interest, and the charges for maintenance, salaries, &c., as the canal yielded no revenue but was merely intended for facilitating the transport between the locks, &c., entitle them, they believe to the sole use of all their improvements, but they represent further:

'That if Your Excellency should order the navigation of the aforesaid canal at the Falls of St. Mary to be laid open, Your Excellency will be pleased to take into consideration the great expense of that establishment, and allow an adequate toll on all property that shall be carried through the said canal,

sufficient to indemnify your memorialists for a just proportion of the said expense, and also proportionate to the benefit to be derived from the ease and security of the said navigation, until which period your memorialists must consider the said canal (but not the other channels, or the road on the British side) as private property, and will prevent all others benefiting by it' (C. 363, p. 10).

"In a memorial by Messrs. Forsyth, Richardson & Co., and by Messrs. Parker, Gerrard, Ogilby & Co., at Montreal, on the 15th April, 1802, and at Quebec, by Mr. John Mure, on the 17th they speak of the canal constructed by the North-West Company as 'a species of canal or dam, on the lower end of which they (the North-West Company) have erected a saw-mill, and which canal or dam facilitates the conveyance of merchandise and furs between the said lakes' (p. 11); insist on their right to make use of it, on payment of a reasonable compensation, and ask that a competent officer be sent to make a survey and report on the said canal or dam (p. 12).

"On the 18th of April, 1803, Forsyth, Richardson & Co., acknowledged receipt from Colonel Mann, through Capt. Bruyères, of a letter informing them that they were to have temporary occupation of lots 3 and 4 below the creek, and enclosing copy of the plan of St. Mary's. They complained also, that their opponents had been allowed to retain all they originally asked for (p. 29).

SKETCH of North Shore at St MARY'S

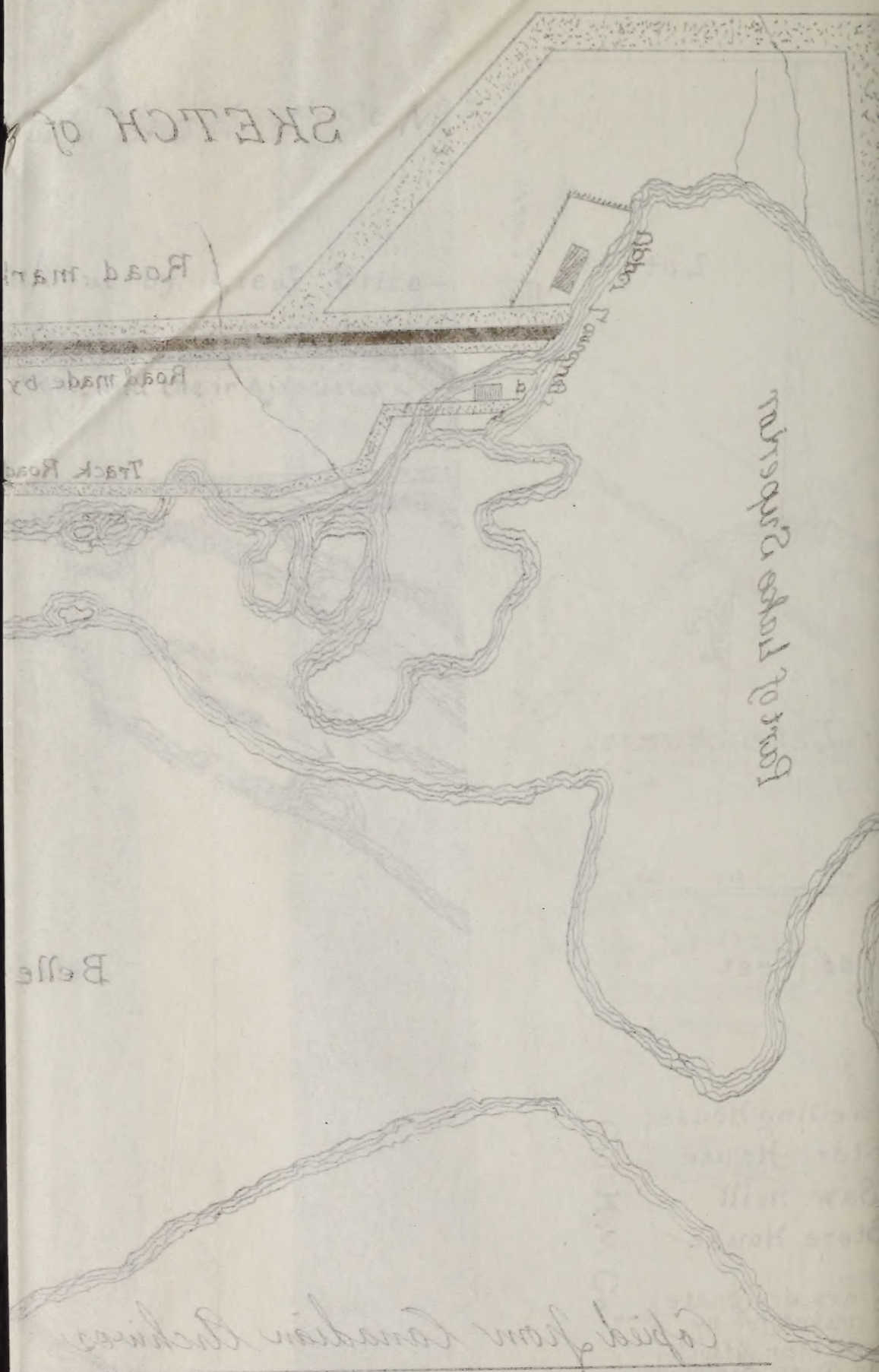


Copied from Canadian Archives

1886

R.C.R.

Lithographed to accompany the Report



Upper Lawrence

SKETCH of

Road made by

Road made by

Track Road

Belle

Copied from Canadian Archives

1885

"To make intelligible the plan accompanying the following letter, which shows the creek but not lots 3 and 4 below, it is necessary to public nearly the whole of the letter from the same firm dated 23rd December, 1803. After explaining why they had delayed writing immediately on the return of Sir Alexander Mackenzie from the Grand Portage, and stating that he and Mr. Forsyth had sailed for London, by the 'Euretta,' the letter continues:

'On their (Sir Alexander and Mr. Forsyth's) arrival at St. Mary's last spring, the ground intended by Capt. Bruyères' report, for the accommodation of ourselves and associates in the North-West trade was again examined, from a desire to avoid further trouble to His Excellency; but Nos. 3 and 4 were still found too distant and unsuitable to our purposes except for pasture. To have built stores there would have subjected us to an additional length of road, through much worse ground, and a heavy expense in making it, beyond what the line of road marked out by Lieut. Brice and Mr. De Pincier, the surveyor required. In consequence, it was indispensibly necessary to decide upon the situation for buildings, to be out of the power of the Americans, and it did not admit of previous communication thereon with His Excellency; a road was immediately begun as nearly in the line of that so marked out as the pickets of our opponents planted across it would permit. That road, by exertion and considerable expense, was rendered practicable before the close of the season, and next summer will be further improved.

'A situation upon a dry spot was marked out, contiguous to that road, for a house, and temporary one erected, also for a temporary store, which will be replaced by more permanent ones, and next year a store immediately upon the waterside will be required to shelter goods as they are disembarked.

'We, therefore, on behalf of ourselves and associates in the North-West trade, to avoid further dispute with the other company, pray that His Excellency will be pleased to give us, by such instruments of writing as he shall see fit, the temporary occupation (until His Majesty's surveys require the abandonment) for buildings of 150 feet in front on the water side below the Sault of St. Mary's, beginning at the north-east side of the road, and running back, parallel thereto, as far as the bend of the said road. There being on the water side, and further on, between our opponents and us, not only the line of road laid out by Lieut. Brice, but the breadth of one made by us this year, there cannot be a better line of division to avoid dispute.

'We have no wish to interfere with any other part of the ground between the road and the creek, and we have no objection to the other company making a road of communication across the said 150 feet, from the portage road to lots Nos. 1 and 2, if they wish it, at a convenient distance behind the store we mean to erect near the water, therefore our occupancy of the space now prayed for cannot incommode them in respect of the pasturage of the residue of lots Nos. 1 and 2. Further to avoid altercation with the other company, in points not essential to us, we shall content ourselves with the road made by us, and not proceed at present in our claim to the use of the canal. To render the portage complete we shall have occasion for stores at the upper end, and accordingly we further solicit a permission of occupancy for about half an acre in superficies, near to the water, but on the other side of the road from where the upper store of the other company is built. To make the whole more comprehensible to His Excellency, we have enclosed a copy of the plan of part of the ground at the Sault of St. Mary's, and noted thereon what we now pray for, which will clearly show that the other company will have very reasonable accommodation, with a fair share around their buildings, and that we ask for nothing unreasonable' (C. 363, pp. 38 to 40).

"Gabriel Franchere (Relation d'un Voyage; Montreal, 1820, p. 276) states that on arrival at the east

end of Michipicoton Bay, on the 26th of July, 1814, he met Captain McCargo, and the crew of one of the schooners of the North-West Company, who had escaped from Sault Ste. Marie. About 150 Americans in command of Major Holmes had attacked the post, pillaged it of every article of value belonging to the company and to Mr. Johnston, and set fire to all the houses, stores, sheds, &c. On the 30th, he, with Mr. McGillivray and others, went to Sault Ste. Marie, where they found the ruins of the buildings, including the saw-mill, still smoking, and the schooner driven down to the foot of the rapid, where she had burned to the water's edge.

"Seven years subsequent to that date (in 1821) the North West Company amalgamated with the Hudson's Bay Company, and new buildings were erected at the Sault. On the 1st March, 1824, 'Thomas Thain, agent for the Hudson Bay Company of Canada,' wrote to Colonel Darling, military secretary, offering 'to enter into such arrangements for the sale of the buildings at present occupied by the servants of the company at St. Mary's as may suit the view of His Excellency.' (C. 363, p.152).

"In the course of the negotiations a plan of the buildings, &c., was sent, which shows the canal, but not the lock, there being marked, however, a race to

the saw-mill, which it is stated on the plan was built in 1821 (C. 363, p. 156).

"The remains of the canal are still visible. Mr. Joseph Wilson, Collector of Customs at the Sault, in reply to inquiries, reports that there is a narrow channel which if a canal at all, was only wide and deep enough for bateaux and canoes. That was all that was intended at the time of construction, as appears by a report made by Capt. Bruyères, dated 10th September, 1802, which states:-

'The landing is in a bay immediately at the bottom of the fall on the nearest channel to the land of the north shore. A good wharf for boats is built at the landing, on which a storehouse, 60 feet long, 30 feet wide is erected. The wharf is planked, and pathways made and planked all around it. Close to the store a lock is constructed for boats and canoes, being 38 feet long, 8 feet 9 inches wide. The lower gate lets down by a windlass; the upper has two folding gates with a sluice. The water rises 9 feet in the lock. A leading trough of timber, formed and planked, 300 feet in length, 8 feet 9 inches wide, 6 feet high, supported and levelled on beams of cedar through the swamp is constructed to conduct the water through the canal to the lock. A road raised and planked 12 feet wide for cattle extends the whole length of the trough. The canal begins at the head of it which is a channel cleared of rocks, and the projecting points excavated to admit the passage of canoes and boats. This canal is about 2,580 feet in length, with a raised bridge or pathway of round logs at the side of it 12 feet wide for oxen to track the boats. About 170 feet from the upper part of the canal a storehouse is built 36 feet long, 23 feet wide. A saw-mill for two saws is constructed and placed in a line with the lock parallel to it' (C. 382, p. 215).

"In the report on Archives for 1886, documents and a plan were published respecting a canal, which had been constructed on the north side of the Sault Ste. Marie, about 1797. The existence of this canal had been entirely forgotten, the only reference made to it being a casual mention in Harmon's Journal and one by Schoolcraft, so that great doubts existed as to whether it was ever in actual use.

"Judge Steere, of Sault Ste. Marie, Michigan, having, on the statements in the reports, called the attention to this subject to Mr. A. S. Wheeler, General Superintendent of the St. Mary's Falls Canal, Michigan, an examination was made by these two gentlemen on the spot, and the results communicated by Mr. Wheeler in a report to Colonel O. M. Poe, of the United States Engineers, at Detroit, a copy of which was kindly sent me, from which the following extracts are taken. It is to be observed that sketch No. 2, mentioned in Mr. Wheeler's report, is a reprint of the plan published in the report on Archives for 1886. The two sketches, Nos. 1 and 3 sent by Mr. Wheeler have been lithographed and published here for reference. After stating that Judge Steere had called his attention to the report, Mr. Wheeler says:

'He invited me to accompany him in a search for the ruins. I did so, and was present when they were found. The unusually low water of this season facilitated the search. Joseph Cozens, provincial land surveyor, of Sault Ste. Marie, Ont., felt much interested in the matter and furnished a gang of men who removed a portion of the earth, which covered and concealed the floor and foundation, all that remained of the structure. These were found to be in perfect condition; indeed, they could be used again for a similar purpose if necessary. Sketch No. 2 is a plan which accompanies a letter written by Messrs. Forsyth, Richardson & Co., and dated April 18, 1803. The gentlemen were former partners in the North-West Company, but were dissatisfied, and seeking to establish a new company. It will be observed that the canal is shown on this plan, but not the lock. Sketch No. 3 shows those parts of the old lock still remaining which were uncovered and examined. These consist of the floor, the foundation on which it rests, the lower ground-sill and the remains of some timbers shown at "D", "E" and "F", the use of which is not exactly understood, but which probably served to connect the lock with its upper approach.

'The floor of the lock is forty feet long and eight feet nine inches in width. It is made of plank two inches thick running longitudinally. They are fastened to transverse foundation timbers with wooden pins shown at "B". There are thirteen planks, the seventh or middle one being narrower than the others. The lower transverse timber formed the sill for the gate. It is twelve inches square. On the top of this is pinned a piece of oak eight inches wide and four inches thick. It is probable that this piece was the cleat against which the lower edge of the gate rested when closed. There are mortises in each end of this timber shown at "A". These mortises, the countersinking and notch in the floor planks seem to indicate that vertical timbers fourteen inches square stood at these points.

'The remains of an old wharf were found at "B", Sketch 1. There are many large boulders along the shore and in the shallow water, but it was observed that all had been removed from in front of the lock,

leaving a wide and safe entrance. At "C", Sketch No. 1, were found old timbers imbedded in the earth on both sides of the stream. These timbers appear to be part of the foundation of a dam. The fall in the water from this point to the old lock is at present about seven feet. It is probable that the dam raised the water two feet, thus giving a lift to the lock of nine feet. The timber used seems to be spruce. There were some nails used about the structure, three or four of which were removed. They were hand-made and seemed to have been cut from a square rod and headed by a blacksmith. The small stream between "A" and "C", Sketch No. 1, seems to be recent. It was probably caused by the dam at "C" and did not exist until after the lock and its approach were destroyed. It is this stream, which carried down the material which covered and concealed the floor and foundations.'

"After quoting the description given by Captain Bruyères, R. E., of the canal, wharf, &c., at the establishment, taken from the report on Archives for 1886, p. xxix, Mr. Wheeler continues:

'It seems probable from this description and from the parts of the structure remaining, that the lock and its upper entrance, or leading trough, as it is called by Captain Bruyères, were both constructed of wood and in the manner of a flume, that is, the bottom and sides were of plank, the sides held in place by verticle timbers tied together at the top by horizontal cross pieces, which were high enough so that boats could pass under them. This theory is sustained by the fact that the transverse timbers still remaining under the floor of the lock have mortises in their ends for verticle timbers and by the further fact that there are no remains of earthworks or retaining walls on either side of the old lock, or its approach.

'The dotted lines from "A" to "C", in Sketch No.1, show the probable location of the approach or "leading trough." The canal mentioned by Bruyeres is still very conspicuous. The "pathway of the round logs" can yet be found in place.'

"Referring to the same report as to Franchere's visit in 1814 (Report 1886, p. xxviii), Mr. Wheeler continues:

'No definite mention is here made of the lock, but it is almost certain that if it had been in existence at the time of the attack it would have been destroyed. Being built of wood and mostly above ground it could have been destroyed as easily as the buildings and sheds. This then indicates a limit to the duration of the lock. It was completed in 1798, and could not have existed after 1814. It is, however, quite possible that it was destroyed or abandoned before 1814, as no reference to it has been found later than 1803. Indeed it is not certain that it was ever successfully used as a lock. It may have early been converted into a raceway for the saw-mill, and this may explain why its existence as a lock has been so completely forgotten.

'It is estimated that there were used in the entire structure 20,000 feet board measure of two inch plank and 5,000 feet running measure of hewn timber.

'Very respectfully, your obedient servant,

'E. S. Wheeler, Gen'l Supt.'

"This report leaves no doubt as to the existence of the lock, and the report of Capt. Bruyères would seem to establish the fact, doubted by Mr. Wheeler, that the lock was in successful operation up to that date - that is, September, 1802. Nothing being, however clearly stated as to the use of the lock, although it is difficult to conceive how access could be obtained to the canal without it, the question becomes one of interpretation of documents. Thanks are due

to Judge Steere and Mr. Wheeler for their courtesy in communicating the result of researches made in the interests of historical truth.

"In 1851 two petitions were presented relative to the construction of a canal on the same side, one on behalf of Angus D. McDonell, of Toronto, praying for an act of incorporation for the construction of a ship canal around the Sault, the other from Frederick Chase Capreol, praying for a charter to be granted to him under certain stipulations for a canal at the Sault to connect Lakes Superior and Huron. A bill to incorporate the Sault Ste. Marie Canal Company, represented by Mr. McDonell, was introduced and passed the second reading, but on the motion for third reading on the 22nd July, 1851, (afterwards Sir Francis) Hincks moved its rejection, which was seconded by Mr. La Fontaine and carried.

"Next year (1852) another petition for a charter was presented by Mr. Allan McDonell, of Toronto, but by this time the canal on the American side was begun by the State of Michigan and completed in 1855. A previous attempt made by that State in 1839 had been defeated by a misunderstanding between the State and Federal governments."

Summary of Developments

Mr. Brymner, Canadian Archivist, also summarizes in a brief résumé an historic account of the comparative sizes and periods of development of the canals originally built to overcome the impediments to free navigation. This résumé is reproduced hereunder verbatim:

"The size at different dates may be compared. The dimensions of the first canals (1779-83) it is not easy to determine. The proposals made by Colonel Mann for the canal to avoid the Cascades, &c., (1801-1805) may be taken as the measure of the others. That at the Coteau du Lac he proposed to enlarge by making the opening of the gates 9 feet 6 inches, to give an additional breadth of 2 feet to the canal and 4 feet to the locks and deepen the whole 1 foot 6 inches. (C. 38, pp. 1, &c.)

"The first canal there (the others appear to have been smaller) must, therefore, in all probability have had the following dimensions: width of lock, 16 feet; width of channel, 8 feet; depth, 1 foot 6 inches. There is no information as to the length of the lock.

"Tabulating the figures according to dates, and taking throughout the gauge of the Lachine Canal for the more modern construction (leaving aside the other St. Lawrence and the Welland Canals, to simplify the comparison), the following progress is shown to this date (December 31, 1886).

Period	Width of Lock	Width of Channel	Depth	Length of Lock
1779-83	16 ft.	8 ft.	1.6 ft.	--- --
1801-05	20 do	10 do	3.0 do	120 ft.*
1821-25	20 do	48 do	5.0 do	100 do
1843-48	45 do	120 do	9.0 do	200 do
1874-83	45 do	150 do	14.0 do	270 do

"* This length was made to enable six bateaux to be passed through at once. The dates indicate the beginning and completion of the works."

To summarize the historical dates appertaining to the building and opening of the canals on the St. Lawrence route a chronology gathered from various authentic sources¹ is incorporated in this report, as follows:

CANAL SYSTEM OF CANADA - TO 1814

EARLY CANALS

Lachine Rapids	Begun in 1700	Work lapsed 1701
Faucille Rapids	" " 1779	Opened by 1783
Trou du Moulin	" " 1779	" " 1783
Split Rock*	" " 1779	" " 1783
Coteau du Lac	" " 1779	" " 1783

* Split Rock and Coteau du Lac were replaced by a single new canal in 1805; enlarged in 1817 and abandoned in 1845.

Sault Ste. Marie* Begun in 1797 Used by N. W. Co.

* All but its timbers and floors destroyed by United States troops in 1814.

Following these dates continuous efforts were made to keep pace with growing needs, and the reader will find the steps leading to the present system described in the following chapter.

1. Sources for Canal Chronology: Douglas Brymner, "Canadian Archive Reports;" "Canadian Statistical Year Book," 1895; International Joint Commission, "Report of the St. Lawrence and Power Investigation," 1921.

CHAPTER IV

THE PRESENT CANAL SYSTEM OF CANADA

Outline of Entire System

The history of canal building in Canada during the nineteenth century is closely interwoven with that of commercial, industrial, and territorial development and expansion occurring within the same period.

The present canal system¹ of Canada comprises a series of canals and canalized waters by which, over a period of little more than a century, a waterway of 1,831 statute miles has been opened to navigation. These canals are classified into two main divisions: the through St. Lawrence and Great Lakes route, and the subsidiary canals or branches of the main system. By the former communication with Atlantic and other sea-ports is made available for vessels of not more than fourteen feet draught which navigate the Great Lakes. The latter, or branch system of canals, performs a

1. "Annual Report of the Department of Railways and Canals": For the Fiscal Year from April 1, 1928 to March 31, 1929. (Dominion of Canada) Ottawa: Ac-land, 1930. p. 85.

dual function: primarily it serves the requirements of a merely local trade, and secondarily it serves as a feeder to the through St. Lawrence and Great Lakes route of traffic other than that of a local nature.

The through navigable waterway between Montreal, at the head of ocean navigation, and Port Arthur and Fort William, located on the Western shore of Lake Superior, comprises about 74 miles of canal, with 49 locks and 1,140 statute miles of river and lake waters, or in all a total of 1,214 statute miles. The minimum depth of water throughout the entire water route at normal low water level is 14 feet. From Montreal, P.Q., to Duluth, Minn., at the southwest end of Lake Superior, the total distance is 1,337 statute miles; and from Montreal to Chicago, Ill., the distance is 1,244 statute miles.

Navigation, for lack of a passageway, terminates at the west shore of Lake Superior. Here connection is made with the Canadian Pacific Railway at Fort William and Port Arthur, which two cities are six miles distant from each other, to points located to the westward and southward. Connection is also made at Fort William with the main transcontinental line of the Canadian National Railways, by the branch line originally constructed by the Grand Trunk Pacific Railway,

but now under the direction of the Canadian National Railways. At Port Arthur an additional connection is available with the Canadian National Railways to points south and west of this city via the old main line of the Canadian Northern Railway.

The accompanying tables¹ on the next two pages show the distances of places located between the Strait of Belle-Isle and Montreal, and between Montreal and Fort William at the Canadian western terminus of navigation.

Six Distinct Canal Systems

The canals of Canada are divided into six separate systems all of which come under the supervision and control of the Dominion Government. The separate canal systems² are as follows:-

1. The Saint Lawrence River canal system between Montreal and Lake Superior, including the Lachine, the Soulanges, the Cornwall, the Farran's Point, the Rapide Plat, the Galops, the Welland, the Welland Ship, and the Sault Ste. Marie canals.

1. Table I taken from publication issued by Department of Marine and Fisheries, Canada, entitled, "Tide Tables and Information connected with the Ship Channel from Father Point to Montreal. Montreal to Lake Ontario and Ottawa River." 1930. p. 56.

2. Annual Report of the Department of Railways and Canals. 1928-29. p. 85.

TABLE I

D I S T A N C E S O F P L A C E S
BETWEEN STRAIT OF BELLE-ISLE AND MONTREAL *

FROM	TO	STATUTE MILES	
		Interme- diate	Total from Strait of Belle-Isle
Strait of Belle-Isle	Cape Whittle	240	240
Cape Whittle	West Light, Anticosti	201	441
West Light, Anticosti	Father Point	202	643
Father Point	Rimonski	6	649
Rimonski	Bic	12	661
Bic	Isle Vert (opposite Saguenay)	39	700
Isle Vert	Quebec	126	826
Quebec	Three Rivers	74	900
Three Rivers	Montreal	86	986
Montreal	Lachine	8½	994½

* Compiled from the General Report of the Minister of Public Works (Canadian Government) for the year ending 30th June, 1871 (Appendix No. 2; page 6 of Appendices to Report.)

TABLE II

DISTANCES OF PLACES

BETWEEN MONTREAL AND FORT WILLIAM *

NAME OF PLACE	M I L E S	
	Statute	Nautical
Lock No. 1, Lower Lock Lachine Canal	0	0
Lock No. 5, Upper Lock Lachine Canal	6.9	6.0
Cascades Pt., Lower Lock Soulanges Canal	23.2	20.1
Coteau Landing, Upper Lock Soulanges Canal	38.1	33.1
Cornwall, Lower Lock Cornwall Canal	70.5	61.2
Dickinson's Landing, Upper Lock Cornwall Canal	80.8	70.1
Farran's Pt. Lock	86.0	74.6
Morrisburg, Lower Lock Rapide Plat Canal	97.0	84.2
Upper Lock Rapide Plat Canal	100.4	87.1
Iroquois, Lower Lock Galops Canal	104.7	90.9
Cardinal, Upper Lock Galops Canal	110.8	96.2
Prescott, opposite Marine Lighthouse Depot	118.9	103.2
Brockville	130.4	113.2
Kingston	182.8	158.7
Toronto	347.3	301.4
Hamilton	372.6	323.4
Port Dalhousie, Lower Lock Welland Canal	346.1	300.4
Guard Lock, Welland Canal	355.1	308.2
Port Colbourne, at G. T. Ry. Bridge	371.6	322.5
Amherstburg	599.8	520.6
Windsor	616.8	535.4
Sarnia	678.8	589.2
Goderich	744.3	646.1
Owen Sound	923.8	801.8
Collingwood	944.3	819.7
Midland	951.8	826.2
Port McNicoll	953.8	827.9
Sault Ste. Marie, Canadian Lock	949.3	824.0
Fort William	1222.8	1061.4

* Table compiled from Canadian Department of Marine and Fisheries, "Tide Tables and Information Connected with the Ship Channel from Father Point to Montreal; Montreal to Lake Ontario and Ottawa River." 1930. p. 56.

2. The Ottawa and Rideau Rivers canal system between Montreal and Kingston, via the Ottawa and Rideau Rivers, including the St. Ann Lock, the Carillon and Grenville and Grenville and the Rideau canals.

3. The Richelieu River Navigation system from the junction of the river with the St. Lawrence at Sorel to Lake Champlain, including the St. Ours Lock and the Chambly Canal.

4. The Lake Ontario to Georgian Bay system via the Trent River, including the Murray and the Eastern and Western divisions of the Trent Canal.

5. The Nova Scotia canal system: the St. Peter's Canal across the isthmus at the southerly end of the Island of Cape Breton connecting the Bras d'Or lakes with the Atlantic Ocean.

6. Miscellaneous Works: (a) The Saint Lawrence Ship Canal, and (b) Hungry Bay and Ste. Barbe Dykes.

It was reported in the Canadian Annual Review of Public Affairs, 1929-1930, (page 344) that Canada had in 1929 ten canals, which were named therein in the following order: Sault Ste. Marie, 1.30 miles; Welland, 26.75 miles; St. Lawrence, 45.99 miles; Chambly 12.12 miles; St. Peters, 0.49 miles; Murray, 5.17 miles; Ottawa, 6.62 miles; Rideau, 133.25 miles; Trent, 238.60 miles; and St. Andrew's (one lock).

The St. Lawrence River Canal System

This system¹ comprises six separate canals at different points between Montreal and Prescott, not including the so-called "submerged canals" or channels dredged through the shallow parts of the entire waterway from Quebec to Duluth, Minn., and, in addition, the present Welland Canal, the Welland Ship Canal, and Sault Ste. Marie Canal.

These inestimably valuable navigation works, which connect Lake Superior, the most westerly of the Great Lakes, through the intervening lakes and the St. Lawrence River, with the seaboard at Montreal Harbour, are as shown in Table III on the next page.

1. Cf. Commissioner of Public Works Report for 1868, p. 4. "The St. Lawrence Navigation extends from the Straits of Belle-Isle to Fond du Lac, at the head of Lake Superior, a distance of 2,384 statute miles.

"The Canadian canals on this route are the Lachine, the Beauharnois, the Cornwall, the Farran's Point, the Rapide Plat, the Galops, and the Welland. Their united length is 70 83/100 miles and the total lockage is 536 1/2 feet, through 54 locks.

"The Farran's Point, Rapide Plat, and Galops canals, are also known under the name of the 'Williamsburg Canals.'

"The Sault Ste. Marie Canal, 1 1/17 miles in length and 18 feet lockage, avoiding the Sault Ste. Marie, and uniting Lake Huron and Lake Superior, was constructed by a Company with the aid of the United States Congress. It lines on the American side of the river. Lake Superior is about 600 feet above the highest tidal flow of the St. Lawrence, at Three Rivers."

TABLE III

THE ST. LAWRENCE RIVER CANAL SYSTEM

Name of Canal	No. of Locks	Mean Rise Feet	Length Miles
Lachine	5	44.75	8.50
Soulanges	5	84.00	14.00
Cornwall	6	48.00	11.25
Williamsburg Group:			
Farran's Point	1	3.60	1.25
Rapide Plat	2	11.60	3.67
Galops Canals:			
Iroquois)			
Junction)	3	15.75	7.33
Galops)			
Welland Ship Canal* . .	7	326.30	25.00
Sault Ste. Marie	1	21.00	1.41
Total	30	555.00	72.41
Add for mean elevation of Lake Superior above sea level:			
Fall on portion of St. Mary's River not overcome by locks		1.0	61.59
Fall on connecting channels:			
Lake Huron to Lake Erie . .		8.8	97.00
Fall on portion of the St. Lawrence not requiring locks			
Kingston to Montreal . . .		14.3	136.80
Difference of level between Montreal Harbour and tide water at Three Rivers . . .		22.5	81.60
Elevation of Lake Superior above sea level at Three Rivers . .		601.6	449.40

* The Old Welland Canal has 26 locks overcoming a mean rise of 326.3 feet; its length is 26.75 miles.

Of the 449.4 statute miles in which occur a rise of 601.6 feet (the mean elevation of Lake Superior) above the mean sea level at tide water, about 124.4 miles are restricted navigation through improved channels and a series of canals, and the remaining 325 miles are open navigation through intervening river sections and lakes as far west as the head of the St. Mary's River at Point Iroquois.

The Lachine Canal

This canal was built to overcome the obstruction to an otherwise unhampered passage¹ of the river St. Lawrence at the Sault Saint Louis, better known as the Lachine Rapids. It is built across the south-east portion of the Island of Montreal, extending from the Harbour of Montreal to the village of Lachine on Lake St.

1. Cf. General Report of the Commissioner of Public Works for the year ending 30th June, 1865. Appendix No. 3; (page 11). Report of J. G. Sippell, Resident Engineer, July 4, 1865. "In passing out of the Beauharnois Canal, vessels find a safe channel from Lake St. Louis, a distance of $15\frac{1}{4}$ miles, to Lachine; the upper entrance to this canal, which is situated on the Island of Montreal, connecting Lake St. Louis with the Montreal Harbour, and forming a navigable channel past the Sault Ste. Louis, or what is now more generally known as Lachine Rapids. This canal is eight and a half miles in length, with five locks 200 feet between quoins, and 45 feet in width, with nine feet water on the sills of the three upper and 16 feet on the sills of the two lower locks, which overcome a fall of $44\frac{3}{4}$ feet."

Louis, and surmounts the rapids which impede free navigation between the Port of Montreal and St. Louis Lake.

The present canal is eight and one half miles in length, is equipped with five locks measuring 270 by 45 feet, and has a total lockage rise of 45 feet. The minimum depth of water at mean low level on the sills at the upper locks is 14 feet; and at the two lower locks it is 18 feet. The canal has an average width of 130 feet. This one, however, was not the first to be built at the Lachine Rapids.

Earlier achievements in canal construction at this place, the first barrier in the St. Lawrence waterway, date back to 1700, in which year Dollier de Casson, the superior of the Sulpicians, let a contract for the construction of a canal from Lake St. Pierre to a point on the St. Lawrence river above the worst part of the Lachine Rapids.¹ This canal was to be about one mile in length, 12 feet wide at the ground surface, and with a depth of 18 inches under the level of the lowest water occurring in the St. Lawrence.² The contractor began work in the autumn of 1700, but financial difficulties overtook him the following year, the climax of

1. Patton, op. cit., Vol. X, p. 504. Vid. p. 60, supra.

2. Ibid., loc. cit. Vid. p. 60 supra.

which resulted in his bankruptcy and a consequent recession of the building program. There remained for further excavation a cut three or four feet deep for a distance of nearly half a mile.¹ But the surplus revenues of the Sulpicians were insufficient to permit appropriation for completing the canal, and the French authorities, although optimistically inclined, were never able to obtain from the King, due to demands for European war purposes, his assent that funds be made available for improvement of navigation in Canada.² The building of the Lachine Canal was left, therefore, for the energetic and enterprising British military forces in Canada to undertake and accomplish.

The increase of trade, particularly the fur trade,³ with inhabitants of Upper Canada, especially after its settlement by the United Empire Loyalists, made the building of a canal at the Lachine Rapids imperative.

1. Ibid., loc. cit. Vid. p. 60 supra.

2. Ibid., loc. cit. Vid. p. 60 supra.

3. Cf. Brymner, op. cit., 1890, p. xxvi, "The value of each canoe load on arrival at Michilimackmak was estimated by Mr. Charles Grant, in 1780, to be £ 600 currency, equal to \$2,640, showing the cost of transport by the Ottawa to have been \$640 for each canoe, the value at Montreal having been \$2,000. In April, 1784, Mr. Benjamin Frobisher wrote that 28 canoes were ready to be sent off, valued at £ 20,000 currency, or \$80,000, a sum for each canoe largely in excess of the estimate made by Mr. Charles Grant four years previously.

Its construction was advocated for some time previous to the passage of the Constitutional Act¹ of 1791. A Bill to carry out the project was introduced by one of the Montreal members in the House of Assembly of the first Parliament,² which commenced in December, 1792. The bill, however, did not receive the joint unanimous support of the Legislative Council and Assembly, because the resources of the Province were considered not sufficient to defray the cost of the proposed project.

Nevertheless, concurrent opinion, influenced not only by the rapidly growing trade with the western territory, especially that with Upper Canada, then a newly constituted Province,³ but particularly the fur trade

1. Cf. Brymner, *op. cit.*, 1891, p. xxviii. The Journals and Statutes were recorded and printed in French and English from the first establishment of the Legislature of Lower Canada under the Constitutional Act of 1791.

2. Cf. Journals of House of Assembly, Lower Canada, 1792. Vol. I. The first meeting, held under authority of the Act, of the Legislature took place on 17th December, 1792. Lieutenant Governor Alured Clark, who had summoned the House of Assembly members to appear in the Legislative Council Chamber, suggested to them that it was His Majesty's desire that they return to their own House and elect a Speaker. Cf. Journals of the House of Assembly of Lower Canada. 1st to 4th Session, 1st Parliament, 1792-1796. Vols. 1-4.

3. Cf. Brymner, *op. cit.*, 1891, p. xxii, "In the summer of 1792, (Governor) Simcoe reached Upper Canada and on the 16th July, issued a proclamation dated at Kingston, that the old Province of Quebec had been divided into two Provinces of Upper and Lower Canada,

coming from Ottawa,¹ favored an early improvement in the navigation of the river above Montreal. Adam Lymburner, a Quebec merchant, persistently urged the Government officials in 1791 to favorably consider the plan for building a canal around the Lachine Rapids, pointing out that the cost of carting the goods from the Province of Upper Canada past the Sault Saint Louis (Lachine) would "fall very heavy on the rude produce of the lands."² But other matters of more vital importance, such as the formulation of statute laws, and the solution of governmental problems, engaged the attention of the members of both Provincial

1. Cf. Brymner, op. cit., 1890, p. xxvi. "The fur traders were, in fact, the merchant princes of that period" (1780 and up). Vid. also p. 138 supra, note 3.

2. Patton, op. cit., Vol. X, p. 508. Cf. Brymner, - - - - - and fixing the division of the province into 'districts, counties, circles or towns and townships,' to carry out the intent of the Act, 'and to declare and appoint the numbers of representatives to be chosen by each to serve in the Assembly of the said Province.' (Q. 278 p. 199.)

"In Simcoe's letter to Mr. Dundas, dated at Niagara 20th August, 1792, enclosing a copy of the proclamation, he stated that the principle adopted 'to equalize the numbers for the purposes of representations was the Militia Returns.' (Q. 278 p. 197.)

"The first meeting of the Legislature of Upper Canada was held at Newark (Niagara) on 17th September, 1792. It sat till the 15th day of October. For a summary of the proceedings reference may be made to Simcoe's letter to Dundas enclosing the minutes of the Assembly and Council."

Legislative Houses, and it was not until the War of 1812, when the Government recognized the necessity of having a free and navigable communication system with the then western frontier of Upper Canada, that serious efforts were made to carry out the project. The exigencies of the war in the transport of munitions acted as an incentive, and in 1815 Governor General Sir George Prevost recommended an expeditious undertaking of the work necessary for the improvement of the inland navigation.

On March 25, 1815, the Legislature of Lower Canada passed an Act intituled, "An Act to grant an Aid to His Majesty, to assist in opening a Canal from the neighborhood of Montreal to La Chine, and further to provide for facilitating execution of the same," appropriating the sum¹ of £ 25,000 for the purpose, and

1. Cf. "The Statute Laws of Lower Canada," Chapter XX, Article 1, Act of 1815 (Volume the Eighth). Vid. also Appendix C, p.423 *infra*.

op. cit., 1889, p. xli. "The history of the Lachine Canal is much the same (meaning the same as Chambly Canal). In Mr. Lymburner's letter, quoted above (deals with Chambly proposal in 1791), he also proposed that a canal should be built from Lachine to Montreal, a distance, he estimates, of about seven miles 'that the boats bringing the produce of the upper settlements for exportation may proceed directly to Montreal. At present every thing going to or coming from these new settlements must be carted that distance, which will fall very heavy on the rude produce of the Lands.' (Q. 57-1, p. 62)

entrusting the execution of the work to commissioners appointed at the pleasure of the Government. Provision¹ was made in Section II of the Act that no portion of the sum of £ 25,000 could be paid out until the Canal was in the course of actual construction. The Commissioners were empowered to make and maintain a navigable canal, with locks not less than fifteen feet in breadth, and water deep enough to permit the passing of vessels with five feet draft.

Captain Samuel Romilly, of the Royal Engineers, was commissioned to survey the project; he made a report in 1817, in which he estimated that a canal with a depth of three feet of water, and of a size capable of passing Durham boats 60 feet long, 13 feet 6 inches wide and drawing 30 inches of water, would cost slightly more than £46,000 Halifax currency, which then amounted to a sum approximating £ 36,800 Sterling.

The Bagot-Rush Agreement of 1817 limiting naval forces on the Great Lakes, brought with it a certain assurance of safety to the Canadians from a military point of view, and no steps were taken to carry out the provisions of the Act passed in 1815, nor to act upon the report submitted by Captain Romilly.

1. Ibid., Article II.

In 1818 the Governments of Upper and Lower Canada appointed commissioners¹ to survey jointly the St. Lawrence and estimate the cost of improving the water communication between the two provinces. The joint commission met, for the first time, at Montreal on the 2nd day of September, 1818, and having agreed to certain resolutions, made a Joint Report² to their respective governments. They strongly recommended that for the greater utility and advantage of both Provinces, it was essential that canals and locks should be constructed of the same dimensions in the one as in the other, so that vessels of the same description might pass freely through the whole system. They further recommended that the dimensions and proportions of the canals and locks ought to be of no smaller size than those of the Great Western Canals in the State of New York, which were rated at forty feet in width on the water surface, twenty-eight feet at the bottom, and four feet depth of water; the length of each lock was

1. The Private Secretary of His Honor Mr. President Smith, then Administrator of the Government of Upper Canada addressed a letter, dated 6th July, 1818, to the Honorable Thomas Clarke and James Crooks instructing them to meet the Commissioners - Jos. Papineau and George Garden - of Lower Canada; this they did on September 2, 1818.

2. Vid. also pp. 66-70 supra, note 1.

rated at ninety feet, and twelve feet wide in the clear. The probable cost of the whole system, due to the "peculiarly favorable situation of the ground" and the "inexhaustable supply of water at the summit level," they estimated at six hundred thousand dollars.

On January 18, 1819, a large group of the leading business men of the Province presented to the Government a petition asking that they be incorporated for the purpose of building the canal at Lachine Rapids.¹ Their request² was granted, and a Joint Stock Company³ known as "The Company of the Proprietors of the Lachine Canal," was chartered, with an authorized capital of £ 150,000, divided into 3,000 shares of £ 50 each. The British Government, which at that time was actively occupied with canal building⁴ in England, readily recognizing the value of the canal from a military point of

1. Cf. Brymner, op. cit., 1889, p. xli, "It was not until 1815 that any steps were taken to construct the canal. Like the Chambly Canal, it was to be the work of a company, but that also had to be assumed by Government, which completed the work in August, 1824, the first vessel passing through in 1825.

2. Cf. "Journals of House of Assembly," Lower Canada, for the Year 1819, et seq.

3. Cf. The Statute Laws of Lower Canada, Act 59, Geo. III, Chapter VI, 1819.

4. Cf. "The Encyclopaedia Americana," 1928, Vol. 5, p. 8, "England was much later (1759) in taking up the system (of canal building) on a large scale, but when it did so, carried out a remarkable one, with great

view, subscribed for 600 shares, while the Government of Lower Canada subscribed for 200 shares.

The canal was to be completed within three years' time, and was to be navigable for vessels drawing not more than five feet. The dimensions¹ were to be as follows: at the surface of the water not less than 40 feet wide; at the bottom 28 feet wide; the locks to be 100 feet long by 22 feet wide. Tolls were inaugurated, ranging from twelve shillings and six pence for vessels under five tons burden up to thirty shillings for vessels of over sixty tons burden, and an additional sum was to be charged of five shillings for each ton of merchandise transported on board the vessels passing through the canal. The tolls were arbitrarily fixed at the above indicated amounts and, if found to be excessive after being in effect for a reasonable length of time, the Legislature, by authority incorporated within the Act, was to reduce them to such an extent as to limit the earnings of the Company to not more

1. Cf. The Statute Laws of Lower Canada, Act 59, Geo. III, Chapter IV, 1819.

feats of engineering. The fathers of it were Francis, Duke of Bridgewater and his famous engineer, James Brindley; and the beginning was the charter for the Bridgewater Canal in 1759. The names of Watt, Telford, Nimmo, Rennie and other noted engineers are associated with it. The last inland canal in Great Britain was built in 1834."

than 15 per cent on the capital outlay. Provision was also made that His Majesty the King at his pleasure could take possession of the canal at any time, either before or after its completion.

However, the prospects of the canal being built were no more encouraging than they had been under Government direction. The Company obtained the services of Thomas Burnett, an engineer from England, whom they directed to make a survey of the location and to submit an estimate of the cost of constructing a canal of the specified dimensions. On this preliminary work was expended in all the sum of £ 2,058. On January 8, 1821, the Company made representations¹ to the Government stating that of the original 3,000 shares of authorized capital stock only 1,780 shares had been subscribed. It petitioned the Government to make certain amendments to the Act of incorporation, extending the three-year limitation of time set for the completion of the canal, and subscribing for an additional number of shares in the enterprise. Action upon the Company's petition was held in abeyance until May. In the meantime,² however, the

1. Cf. Journals of House of Assembly, Lower Canada for the year 1821 et seq.

2. The Government of Upper Canada passed a bill on 14th April, 1821, for appointing Commissioners to investigate and report on the improvements which could be affected in the "internal navigation," particularly that of the St. Lawrence River.

Government on 17th March, 1821, placed¹ on the Statute Books an Act intituled, "An Act for making a Navigable Canal, from the neighborhood of Montreal to the Parish of Lachine, and to appropriate a certain sum of money for that purpose, and to repeal a certain Act therein mentioned." In Section I of this Act provision was made that in case the Company of Proprietors incorporated by Act 59, Geo. III, Chapter VI did not complete the canal from Montreal to Lachine within the time prescribed by that Act, then the sum of £ 25,000 granted by Act 55, Geo. III, Chapter XX and the further sum of £ 10,000 granted under Act 59, Geo. III, Chapter IV, Section III should be appropriated to the completing of the said Canal at a later date. A further provision was also made in Section II of the Act, that, if the commander of British Forces in Lower Canada should contribute a sum of £ 10,000 currency towards the building of this canal, all vessels laden with military stores would pass and repass at all times "without paying any toll or duty whatsoever."

By Section XXVI of Chapter VI of the Act of 1821, the previous Act², passed in 1815, granting financial

1. Cf. The Statute Laws of Lower Canada. Geo. IV, Chapter VI, Section I. (Volume the Eleventh.)

2. Act. 55, Geo. III, Chapter XX, 1815. "An Act

assistance to His Majesty to the amount of £ 25,000, was repealed. In May, 1821, the Government passed a bill¹ repealing the corporation of the "Company of the Proprietors of the Lachine Canal," and authorizing the construction of the Canal by Government enterprise in the month of July following. The Government, therefore, bought out the Company for the amount it had expended in development work, and itself, by virtue of vested authority, undertook once again the building of the Canal.

Commissioners were appointed in 1821 under the corporate name of "Commissioners of the Lachine Canal," with John Richardson as chairman thereof and superintendent of the work. The work was commenced 17th July, 1821, and was vigorously pushed forward with a gang of nearly four hundred men.

The project, as originally conceived, was for a canal to run from the village of Lachine across the Island of Montreal to the foot of the current of St. Mary, but the exorbitant prices asked for land in this

1. Cf. "Journals of House of Assembly," Lower Canada, for the Year 1821.

- - - - -
to grant an Aid to His Majesty, to assist in opening a Canal from the neighborhood of Montreal to La Chine, and further to provide for facilitating execution of the same."

section of the island compelled the commissioners to place the terminus nearly three miles above Montreal where the velocity of the current was greater. This change in location was permitted by the instructions within Section V of the Act (1821) which directed the commissioners to build a navigable canal, the locks of which were not to be less than 20 feet in width, and not more than 100 feet in length, or not less than 40 feet at the surface of the water, and 28 feet at the bottom, and navigable for vessels drawing 4 1/2 feet of water, "from the neighborhood of Montreal to the Parish of Lachine, in the line and direction which shall be most convenient and practicable for the said undertaking."¹

As originally constructed, the canal was about 8 1/2 miles long, with a width at the bottom of 28 feet and at the surface of the water through earth a width of 48 feet. Where the canal passed through a rocky section of the route it was made 36 feet wide at the water surface. The whole had 5 feet depth of water.

The locks, seven in number, were each 100 feet

1. Cf. The Statute Laws of Lower Canada. Geo. IV, Chapter VI, Section V, 1821. (Volume the Eleventh.)

long and 20 feet wide with a depth of 5 feet, and were substantially built of cut stone. At the time of its construction there were no canals in Great Britain as large with respect to breadth, depth of water, length and breadth of locks, except the Caledonia and the Forth and Clyde Canals.¹ The canal was opened in August, 1824, but vessels did not move through until 1825, due to the fact that shipping companies had previously contracted with transporting concerns for the carriage of their goods across the portage for the year 1824.

The cost of construction up to March, 1826, was £ 109,601 of which the British Government contributed² £ 10,000 on condition that their vessels either light or burdened with military stores be permitted to pass and repass free of toll charges.

In the year subsequent to the completion of the Lachine Canal Sir James Carmichael Smyth sent a letter, dated 14th March, 1826, to General Gother Mann, then Inspector General of Fortifications, directing

1. Cf. Chamber's Encyclopaedia. 1923. Vol. II, p. 707.

2. Cf. Statute Laws of Lower Canada. Geo. III, Chapter VI, Section II, 1821. (Volume the Eleventh.)

that an officer of the Royal Engineers' Corps be assigned to "complete and correct the preliminary surveys" previously made by Samuel Clowes, a Civil Engineer. General Mann selected Lieutenant Colonel By as the officer most capable to take charge of the work, and instructed him to obtain the estimates and surveys for Improvement of the Navigation, "drawn up by a very able, practical civil engineer,"¹ which had been laid before the Legislature of Upper Canada, and also the reports of the American engineers appertaining to their canal system.

Lieutenant Colonel By strongly recommended in a letter on the 13th July, 1826, to General Mann the "formation of an uninterrupted steamboat communication" from Quebec as far westward as Lake Superior, by sufficiently enlarging the locks so as to permit the passage of steam-vessels, of which a great many were being then built for the navigation of the Great Lakes, and to make practicable by locks and otherwise deepen the Northern passage round the Island of Montreal.² His recommendations, nevertheless, met with strong opposition from Sir James Carmichael Smyth who wrote to General Mann

1. Cf. Brymner, op. cit., 1890, pp. xxviii-xxxi.

2. Cf. Report of Canadian Archives, 1890, Note D, p. 70 et seq.

shortly thereafter stating¹ that a canal of 20 feet breadth of locks would pass gunboats, the craft of the country, and would pay for its construction. Sir James further asserted that he did not see how any benefit could be derived from a great breadth without a corresponding depth. "Locks of 20 feet in breadth," he says, "will afford every advantage; a larger canal will never pay, will cost a prodigious sum and will not afford corresponding advantages."²

The steadily increasing volume of goods to be transported from Upper Canada was a matter of vital concern to the commercial interests in those days. The people of the Upper Province were consistently agitating for more and better improvement of navigation in the St. Lawrence River. This agitation began prior to the union of the two provinces into the Province of Canada, in 1840, and its continuance thereafter finally led to the appointment of Lieutenant Colonel Phillpotts to report on the then present state of the canal navigation of the country. He recommended that a new cutting should be made on the Island of Montreal for the Lachine Canal. This cutting should be commenced at

1. Cf. Report of Canadian Archives, 1890, Note D, p. 70 et seq.

2. Ibid., loc. cit.

Leishman's Point, a place about one-half mile farther up the river, and should be continued for the major part of the accepted route. The locks were to be the same size as those previously recommended for the entire Canadian canal system.

Lieutenant Colonel Phillpotts proposed to reduce the number of locks from seven to six, and estimated the probable cost of the improved canal at £ 324,600. Subsequent to the rendering of his report the engineers of the Montreal Board of Works made a survey and estimated the cost of all improvements on the canals essential for the accommodation of vessels navigating the Great Lakes. Their estimate differed substantially from that submitted by Lieutenant Colonel Phillpotts, hence they disregarded his recommendations and advised that the old route for the Lachine Canal be retained.

Work on the proposed enlargement was begun in 1843. During the alteration the navigation was kept open for the season. The new locks were constructed, in the summer months,¹ by the side of the one originally built. The deepening of the bottom and the enlargement of the canal proper were carried on after the

1. Cf. Report of Board of Works, Montreal, December, 1844, p. 7.

"So intimately connected," reports Mr. Killaly,

close of navigation in November. Where practicable the Canal itself was straightened and improved so as to provide better navigation facilities for steamboats; the width at the bottom was 80 feet and at the top was 120 feet, so that two vessels could pass in any point of its waters.

The number of locks was decreased from seven to five, each being 200 feet long between the quoins and 45 feet wide, with 9 feet of water on the mitre sills, except in the case of the two lower ones, which, on the persistent representations¹ of the Board of Trade

1. Cf. Report of Board of Works, Montreal, December, 1844, p. 7.

"A change has been authorized," reports Mr. Kilgaly, the President, "by His Excellency the Governor-General in Council, upon the representation of the Board of Trade of Montreal and the mercantile interests generally (in which I fully concurred) of a very important nature, and from which benefits will be obtained much more than commensurate with the additional expense caused by the change. The alterations alluded to, are the laying the foundations and sills of the last Lock at the Montreal terminus and the deepening of the Lower Basin, so as to admit of the largest class

President of the Board, "are these new works of enlargement with those of the original canal, that no little pains and foresight have been necessary to prevent much annoyance to the trade during their progress, that some inconvenience should be experienced it was impossible to avoid. Every exertion, however, has been made to lessen it, and to meet the wishes and convenience of the Forwarders as much as possible, and I have reason to believe that our endeavors are duly appreciated."

of Montreal and the merchants, were constructed with 16 feet of water over the sills; the total rise of lockage by the five locks was $44 \frac{3}{4}$ feet.¹ The lower basin was also deepened, in 1844, at an additional expenditure of about £ 16,000. In the spring of 1848 the Canal was sufficiently enlarged to allow the passage of vessels.

But it was not until May, 1862, that the Canal was excavated to the full width outlined in the plan of 1843. Some two miles or more inland from Lachine lies the base of the Silurian groups, the extremity of which reaches to the vicinity of the canal; to cut

1. Cf. Report of the Commissioner of Public Works for the year ending 30th June, 1865, p. 10:

"Lachine Canal

"Length of Canal	8½ statute miles
"Number of locks	5
"Dimensions of locks	200 feet x 45 feet
"Total rise of lockage	44¾ feet
"Depth of water on sills (at 2 locks	16 feet
(at 3 locks	9 feet

"The Lachine Canal carries navigation round the St. Louis Rapids."

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of Atlantic Vessels, which frequent the Port, to enter and load or discharge in the Basin. The Basin will also afford safe wintering, of which this Port is now entirely devoid. These great advantages will be obtained by an extra expenditure of about £ 16,000; whereas, were preparations not now made to effect them, not only would four times that sum be required to accomplish them at any subsequent period, but the Trade of the Country would have to be deprived of the use of the Canal for at least one Year."

through this formation was a laboriously prolonged and expensive task. The narrowest part of this cut¹ is 100 feet, and it was then pronounced the finest portion of the St. Lawrence canal system.

Even with all this improvement public sentiment still was agitating for a better and larger navigable waterway from the Ocean to Lake Superior. John G. Sippell, Superintendent Engineer, Lachine Canal, in his report to the Commissioner of Public Works of Canada for the year clearly and emphatically set forth, with regard to the advisability of developing a "uniform scale of navigation" throughout the entire waterway, his opinion in the following language:

"Propellers and other large vessels engaged in the through trade between the West and Montreal, suffer much inconvenience and loss in consequence of being obliged to break bulk by the discharge of a portion of their cargo before entering the St. Lawrence canals, which must necessarily increase the cost of transportation, and is an inducement on their part to force their way through the St. Lawrence Canals, drawing more than nine feet of water - the depth of water being 10 feet in the Welland Canal and 9 feet in the St. Lawrence Canals. This difficulty can only be

1. Cf. Report of the Minister of Public Works (Canada) for the year ending 30th June, 1862. (Appendix C.) p. 84.

"The work of enlarging this canal through the Rock Cut, near Lachine, referred to in last year's report, was completed the beginning of May (1862), and now forms the finest portion of the St. Lawrence canals; the narrowest portion of this cut being one hundred feet in width."

overcome by establishing a uniform scale of navigation throughout. The small locks on the Welland Canal are 150 feet in length by 26 feet in width, with 10 feet of water, while the locks on the St. Lawrence Canals are 200 feet in length by 45 feet in width, with 9 feet of water. Still vessels pass through the Welland Canal with nearly one-third more cargo than through the St. Lawrence Canals. It is, therefore, of great importance to the trade of the Province, and especially with the West, that the depth of water in the St. Lawrence canals should be increased to 10 feet, as in the Welland Canal, and until this is accomplished, this great inland scheme of navigation must remain imperfect and to a certain extent unsatisfactory."¹

A Canal Commission was appointed under the Great Seal of Canada on the 16th November, 1870; it was authorized to make a "full and complete enquiry and report upon the works and improvements necessary to make such a thorough and comprehensive improvement of the canal system of Canada, as might meet the growing traffic and commerce of the Dominion, and afford increased facilities for carrying to the seaboard through Canadian waters, the products of the Great Western Country."²

The Commission, on the 25th November, 1870, held its first sitting at Ottawa; and presented a report which was in the nature of a letter to the Honorable

1. Cf. Report of the Commissioner of Public Works (Canada) for the year ending 30th June, 1865 (Appendix C.) p. 75. Vid also note 2 page 157 infra.

2. Cf. General Report of the Minister of Public Works (Canada) for the Fiscal year ending 30th June, 1871, pp. 3-4. Vid. also Commissioner's recommendations to the Government reprinted on pp. 92-93 supra, note 1.

the Secretary of State. This report, by order of His Excellency the Governor General, was laid before Parliament, which was then in session.

Amongst the recommendations set forth in the Commissioners' report were the following dealing with the subject of improvements:

"That as regards the proper scale of navigation for the main line of water communication, from Lake Superior to tide-water, there should be one uniform size of lock and canal throughout: the locks to be 270 feet in length of chamber between the gates, and forty-five feet in width, having twelve feet of clear draught from the mitre sills of the locks, and to have a width throughout of not less than 100 feet, to admit vessels passing through with perfect ease in any part of the canal.

"Deepening of the navigable channel in the River St. Lawrence, between Quebec and Montreal, to twenty-two feet draught at low water.

"The enlargement of the St. Lawrence Canals to the same scale as the Welland (smallest being 150 x 26 feet, with 10 feet of water). At the lower entrance of the Lachine Canal, another set of locks to be constructed, with seventeen feet of water on the mitre sills, forming a second line of communication between the Montreal Harbor, and the upper (No. 2) basin of the canal.

"The improvement of the channel in the River St. Lawrence, above Montreal, by removing all obstructions in the river and lakes, so as to give fourteen feet of water throughout."

The Canadian Parliament, acting on these recommendations, immediately voted an appropriation for the improvement of the channel of the River St. Lawrence and the enlargement of the Lachine Canal: the locks to be

270 feet by 45 feet, and 12 feet of water on the sills. In 1875, the Canadian Parliament issued instructions to the effect that the enlarged canals, including the Lachine Canal, should be deepened to 14 feet so as to pass vessels of greater draft than hitherto permitted.

The present canal was opened in 1901. The following detailed statement,¹ taken from a publication issued by the Canadian Department of Railways and Canals, and entitled "St. Lawrence River Route and Canals, 1918," gives a very comprehensive picture of the canal as it is today:

LACHINE CANAL

Length of canal	8½ statute miles
Number of locks	5
Dimensions of locks	270 feet by 45 feet
Total rise of lockage	45 feet
Depth of water on sills, at 2 locks	18 feet
Depth of water on sills, at 3 locks	14 feet
Average width of new canal	130 feet

Its locks are operated electrically, and it is lighted the entire length of the route by electricity. The old lift-locks, 200 feet long and 45 feet wide, with locks giving a depth of nine feet on the mitre sills, are still available for use. After their construction, however, the two lower north locks were

1. Compare with the detailed statement of particulars (as shown in footnote 1, p. 155 supra.) of the Lachine Canal as reported by the Commissioner of Public Works for the year ending 30th June, 1865.

lengthened to 270 feet, and deepened to about $16\frac{1}{2}$ feet of water on the mitre sills. There are two distinct systems of locks - the old and the enlarged - with one canal channel, having two lock entrances at each end.

The amount expended by the Lower Canada Executive before the Union, in 1840, was \$398,404.15; the amount expended by the Canadian Department of Public Works from the date of the Union up to December, 1863, was \$2,116,902.38; while the Lachine Canal was carried on 31st March, 1921, in the Capital Account of Canals by the Department of Public Works at the figure of \$14,132,684.80.¹

Beauharnois and Soulanges Canal

The Beauharnois Canal: After passing through the Lachine Canal en route up the river St. Lawrence, and sailing in a south-westerly direction across the waters of Lake St. Louis for a distance of $15\frac{1}{2}$ miles, a series of three rapids - The Cascades, the Cedars, and the Coteau - are encountered, obstructing an otherwise clear passageway into Lake St. Francis. This distance from Lake St. Louis to Lake St. Francis is approximately 11 miles, of which some 7 miles are of actual

1. Cf. the Annual Report of the Department of Railways and Canals for the Fiscal Year from April 1, 1928 to March 31, 1929, p. 63.

rapids; the other 4 miles are broken into stretches of water of sufficient depth and quietness to permit easy navigation.

As previously stated in the chapter¹ preceding, the availability of a navigable water route in this portion of the St. Lawrence River was the result of the untiring efforts of the Royal Engineers, particularly Captain Twiss, between the years 1779 and 1783. Four canals were built within that four-year period: the so-called "Old French" Canal at Faucille Rapids, the "Trou du Moulin," the "Old Lock" at Split Rock, and the Coteau du Lac; the locks at Split Rock and Coteau du Lac "were partly rebuilt, and a new canal, about half a mile in length, with 3 locks, 6 feet in width between the quoin posts of the gates, was constructed at the foot of the Cascades, instead of the old French locks at the 'Faucille' and the 'Trou du Moulin' ", in 1804.² As years passed by these canals were found to be inadequate for the increasingly growing volume of traffic, consequently, in 1817, their width was doubled and their depth increased to 3½ feet

1. Vid. pp. 95-110 supra; and the footnotes appended thereto.

2. Cf. Report of the Commissioner of Public Works (Canada) for the year ending 30th June, 1867, p. 566. Vid. also pp. 96-97 supra, note 1.

in order to permit the passage of Durham boats and large-size bateaux having a carrying capacity of a hundred barrels of flour.

But the volume of goods to be transported was steadily growing larger each succeeding year so that in a decade, subsequent to 1817, the enlarged canal had been outgrown once more by the volume of traffic and the size of the boats. In 1833, the Government of Lower Canada appointed commissioners¹ to investigate and survey the navigation of this portion of the River St. Lawrence. In 1834, John B. Mills, their engineer rendered to the Government three plans, all of which contemplated placing a canal on the north shore, the site of the present Soulanges Canal. The plan which he recommended as the most feasible called for the building of three short canals to overcome individually each of the three rapids, and the utilization of the two stretches of calm navigable waters between the rapids. The special committee of the Assembly approved this plan as the most practicable one, and recommended that a grant of money should be made to carry out the project; but no further favorable consideration was given at the time.

1. Vid. p. 89 supra.

In 1834 Alexander Stevenson submitted to Parliament a plan¹ for building a canal at less cost on the south shore of the St. Lawrence River, and the following year other plans were presented for a south shore canal. Construction of this canal in 1839 was still unattempted, when Lieutenant Colonel Phillpotts submitted his report² to Lord Durham on canal navigation in Canada. Although he concurred with other engineers that a canal built on the south shore would cost less than one built on the north shore, he, nevertheless, did consider the latter more secure from a military point of view, and adhered to the plan John B. Mills submitted in 1834.

Much discussion³ ensued in the years following his decision, and finally it was concluded to build the Beauharnois Canal on the south shore. The contracts were let in June, 1842, and the work⁴ was

1. Patton, op. cit., Vol. X, p. 512.

2. Vid. p. 90 supra.

3. Cf. Kingsford, "The Canadian Canals; Their History and Cost," 1865, p. 51. "The natural position of the Beauharnois Canal is where it is placed (the south shore). To have taken it on the other side of the river would have been to abandon the pleasant, easy navigation of Lake St. Louis, for the difficulties, intricacies and shoals of the Ottawa, on the opposite shore. The rapids of the Cascades extend below the Junction of the Ottawa with the Saint Lawrence, and the approach to any Canal there would have been expensive to construct, and when constructed not good. Mr. Killaly's choice of ground must therefore be perfectly vindicated."

4. Cf. Report of Board of Works, Montreal, December, 1844, p. 6.

completed so that vessels could pass through it before the end of October, 1845. The canal¹ was 11 $\frac{1}{4}$ miles in length and there were nine locks to overcome a total rise of 82 $\frac{1}{2}$ feet; each lock was 200 feet long by 45 feet wide. The canal channel was made from 60 to 80 feet in width at the bottom and from 100 to 120 feet at the water surface. The first vessel to pass through the canal was the "Alboin," Captain Chambers. The engineers experienced much difficulty in obtaining a

1. Cf. Report of the Commissioner of Public Works (Canada) for the half-year ending 30th June, 1864. (Appendix C. page 31) Report of John G. Sippell, then Superintending Engineer at the Lachine Canal Office, dated 2nd December, 1864.

"This canal forms a navigable channel past the Coteau, Cedars and Cascades Rapids between Lake St. Francis and Lake St. Louis, and is 11 $\frac{1}{4}$ miles in length, with nine locks 200 feet long by 45 feet in width, with 9 feet depth of water on the sills. The canal is from 60 to 80 feet in width on bottom, and from 100 to 120 at surface water. At each lock there is a regulating-weir built of stone masonry for passing and regulating the flow of water, which affords a large amount of water-power available for milling and manufacturing purposes. There are also nine swing-bridges, two ferries, twenty permanent bridges over the regulating-wash, ten culverts, two dams, half a mile of dyke on Grand Isle, 4 86/100 miles of dyke through Hungry Bay, a pier and breakwater at Gross-point, a house for the local Superintendent, one for the Collector and Paymaster, ten for the lock and bridge-masters, and eighteen for the assistants. There is also a head-race and regulating-weir at each end of the lower dam, built for milling and manufacturing purposes. In addition to the above there are about 350 arpents of ditches, all of which have been effectually maintained, and special care taken to keep the culverts and ditches open for the free discharge of surface-water during the spring freshets."

satisfactory navigation to the upper entrance. A shoal lay across the entrance, the current was very strong, and the channel beset with large boulders. After the steamer "Magnet," Captain Sutherland, was sunk in 1846, a year after the opening of the Canal, by being carried past the entrance and striking on the rocks, which stove in her planking, a dam was constructed across the south branch of the St. Lawrence. This dam was completed in 1849 at a cost of approximately £ 6,000.

The Beauharnois Canal is still in existence, but no longer used for navigation purposes, since the construction of the Soulanges Canal. In 1907, the Beauharnois Canal¹ was leased to the Canadian Light and Power Company, and outside of a few minor works connected with it, is no longer under the control of the Department of Railways and Canals. The minor works include those such as the Hungry Bay and Ste. Barbe Dykes.

The Soulanges Canal: This canal was built on the north side of the St. Lawrence river to replace the one previously constructed on the south side.

1. Cf. Annual Report of the Department of Railways and Canals (Canada) for the fiscal year from April 1, 1917 to March 1, 1917. (Appendix III), p.65.

Work on it was commenced in 1891 and terminated in 1899, when the canal was opened for navigation. Its length is 14 statute miles, and it has five locks - 4 lift and 1 guard - instead of nine used on the abandoned Beauharnois. Each lock is 280 feet long and 45 feet wide, with 15 feet depth of water on the sills; the total rise of lockage is 84 feet. The breadth of the canal is 100 feet at the bottom and 164 feet at the water surface.¹ The distance from the Soulanges to the Lachine Canal is 16 statute miles through the navigable waters of Lake St. Louis.

From the head of the Soulanges Canal to the entrance of the Cornwall Canal is 31 miles. The course lies through Lake St. Francis, which is navigable for vessels of 14 feet draught.

The Cornwall Canal

The distance from the head of the Soulanges Canal to the discharge of the Cornwall is $32\frac{3}{4}$ miles.² The latter Canal is situated on the north bank of the river St. Lawrence and overcomes the Long Sault Rapids. It extends from the town of Cornwall to Dickinson Landing, a distance of $11\frac{1}{4}$ miles; and is used by vessels,

1. U. S. War Department, "Survey of Northern and Northwestern Lakes," April, 1930, p. 432.

2. Ibid., pp. 431 and 432.

except special passenger steamers that run the rapids both ascending and descending the waterway.

The Canal channel has a width at the bottom of 90 feet and at the water surface 154 feet. There are six locks and a guard lock, each 270 feet (available length 255 feet) by 45 feet, depth of water 14 feet on the lock sills, and a total lift of 48 feet.

The question of building a canal around the Long Sault Rapids, and thus surmounting this impeded section¹ of the St. Lawrence, was given much thoughtful

1. Cf. International Joint Commission's "Report on the St. Lawrence Navigation and Power Investigation," 1921, p. 43. In a report made by Colonel J. G. Warren, United States Corps of Engineers, the following description of the Long Sault Rapids section of the St. Lawrence River is given:

"Just below Richards Bay, at Tallcotts Point, the Long Sault Rapids begin and extend, including deep rapid-current channel below the rapids, for 11½ miles down to Massena Point (mouth of Grass River), with a fall of 48 feet. The American channel within this reach is narrow and tortuous, comprising the South Sault Rapids and having swift current throughout, rendering it commercially unnavigable. About 2 miles below Richards Point is located the St. Lawrence River Power Co.'s canal, 3 miles long, which diverts at maximum about 30,000 cubic feet of water from the St. Lawrence River and discharges it through a power house, head of water about 40 feet, into the Grass River, which parallels the St. Lawrence at the locality, 7 miles to mouth.

"The Canadian channel within this reach is navigable only by special passenger steamers and small craft which run the rapids. The rapids are overcome by the Cornwall Canal, used by vessels both ascending and descending.

consideration in 1816 by the Legislature of Upper Canada.¹ At the opening of the First Session of the Seventh Provincial Parliament of Upper Canada on 4th February, 1817, the Lieutenant Governor, in his speech,

1. Cf. Journals of the House of Assembly, Upper Canada for the Year 1816 et seq. Vid. also pp. 70-77 supra, note 1, and pp. 62-63 supra, note 2.

In that year Mr. Nichol - a member of the House of Assembly and first named of a committee appointed to consider jointly with a committee from the Legislative Council the "subject of the Inland Navigation of this Province" - reported that the joint resolution had been agreed upon. The resolution submitted to and accepted by the House read as follows:-

"At a conference held in the Chamber of the Hon. the Legislative Council, on the 27th day of February, 1816, after a very full discussion on the subject of inland navigation, it was considered as the most eligible plan to appropriate a sum of money to enable the Governor, Lieutenant-Governor, or person administering the Government, to employ proper persons to make complete surveys of the different routes or water communications between the Lakes Erie and Ontario, and between Lake Ontario and Lower Canada.

"That nothing further should be done respecting it until after the persons who may be appointed to make the surveys shall have delivered in a report with correct plans and estimates of the expense; and that after the appropriation shall have been made, the Governor, Lieutenant-Governor or persons administering the Government be requested by Joint Addresses to take measures for carrying into effect, with as little delay as possible, the wishes and intentions of the Legislature.

"(Signed) Robert Nichol, Chairman."

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"From Massena Point to St. Regis, where the international boundary leaves the river, $6\frac{1}{2}$ miles, fall about $2\frac{1}{2}$ feet, the United States channel is of ample width and 30 to 50 feet deep, except opposite the mouth of Raquette River, where controlling depth is 22 feet. This stretch of river is practically an arm of the Lake St. Francis pool, which lake is wholly in Canada."

said: "The water communication of the River St. Lawrence, below Prescott, is also deserving of your serious consideration." It was very readily comprehended that all progress in the Western Provinces depended without the least doubt on communication with the seaboard, and that this connection must necessarily be obtained by building canals, which would surmount the natural barrier in the waterway.

The inhabitants of Upper Canada did not procrastinate in their earnest and persistent efforts to keep before the Legislature the importance of better water communication with the Lower Province. On 21st February, 1817, a petition from Adam Dixon, a merchant of Cornwall, was introduced in the House of Assembly and read for the first time. He petitioned that the Legislature pass an Act of the Provincial Parliament¹

1. Cf. Journals of the House of Assembly, Upper Canada for the Year 1817 et seq. (21st February, 1817).

"Mr. Van Koughnet, seconded by Mr. McNabb, moved that the sixth rule of this House, as far as relates to a petition being brought up being ordered to be on the Table at least two days before it is read, be dispensed with, and that the petition of Dixon, of Cornwall, with the recommendation of sundry inhabitants, be read the first time this day, which was agreed to, and the petition read as follows:

"To the Honorable the Knights, Citizens and Burgesses of the Province of Upper Canada, in Provincial Parliament assembled.

"The Humble Petition of Adam Dixon, of Cornwall, in the said Province, Merchant, respectfully sheweth

whereby he would be allowed, authorized and empowered to make such number of locks on that branch of the

that the greatest difficulties are experienced in the navigation of those parts of the River Saint Lawrence called Moulinette and Mille Roche in the Township of Cornwall, in the said Province of Upper Canada, in consequence of the immense rapidity of the current, and the shallowness of the water.

"That those difficulties are severely felt by those who are in the habit of trading with the Lower Province, and are sometimes productive of dangerous consequences.

"That to remove them would be to confer a benefit on the Public at large, by facilitating the intercourse between the two Provinces, particularly at a time when in a neighboring country every effort is made at internal improvements for the purpose of diverting into new channels that trade which we have hitherto enjoyed.

"That the navigation of the River St. Lawrence at the above mentioned places might be rendered safe and easy by the means of locks, to be established at certain distances.

"That Your Petitioner is desirous of embarking in the undertaking if he is so fortunate as to meet the sanction and support of the Legislature, which sanction and support he flatters himself this Honorable House will extend to him in proportion to the capital which it would be necessary to employ, and to the task and responsibility he must necessarily incur.

"Therefore Your Petitioner humbly prays that by an Act of the Provincial Parliament to be in that behalf made and passed, Your Petitioner be allowed, authorized and empowered to make such number of locks on that branch of the River St. Lawrence at the said place, called Moulinette and Mille Roche, in the whole extent of the rapids of the said places as may be necessary to facilitate the navigation of the said branch of the said River, with the exclusive privilege to him, the said Petitioner, to take such tolls and rates for the passing of the boats for and during such term of years and under such other conditions and regulations, as to this Honorable House in its wisdom may seem fit and proper.

"And, as in duty bound, Your Petitioner will ever pray.

"Cornwall, 31st January, 1817.

"ADAM DIXON"

River St. Lawrence at the said place, called Moulinette and Mille Roche, in the whole extent of the rapid of the said places as might be necessary to facilitate the navigation of the said branch of the said River, with the exclusive privilege to himself to take such tolls and rates for the passage of boats for and during such term of years, and under such other conditions and regulations, as to that Honorable House in its wisdom might seem fit and proper. His petition was supported by commercial interests from both the Upper and Lower Provinces of Canada.¹

1. Cf. Journals of the House of Assembly, Upper Canada for the Year 1817 et seq. (21st February, 1817.)

"We, the undersigned, Merchants of Upper Canada, having taken communication of a petition about to be presented by Adam Dixon of Cornwall, in the Province of Upper Canada, to the Hon. the House of Assembly of the said Province of Upper Canada, humbly beg leave to state, that from our experience in the trade of Lower Canada great delays are produced and great losses are incurred in consequence of the rapids at Moulinette and Mille Roche.

"We also beg leave to express our conviction that the project which the above gentleman has in view, of facilitating the navigation, would be, when executed, of incalculable advantage to the Two Provinces and that the said Gentleman possesses all the qualifications necessary for the purpose.

"Province of Lower Canada, Dist. of Montreal.

"(Signed) Henry Denning and eleven others."

"We, the undersigned, Merchants and Citizens of Montreal aforesaid, having taken communication of a petition about to be presented by Adam Dixon of Cornwall, in the Province of Upper Canada, to the Hon. the House

Three days later two more petitions, one by Alexander Hover, a merchant in the Township of Cornwall, and the other by David Sheek, also of Cornwall, were introduced in the House of Assembly.

Alexander Hover, in his petition,¹ stated that he

1. Cf. Journals of the House of Assembly Upper Canada, for the Year 1817 et seq. (24th February, 1817).

Mr. McMartin motioned that the Sixth Rule of the House of Assembly be dispensed with in so far as it concerned Petitions lying on the Table for two days before being read, and that permission be granted, which was given, for the Petitions of Alexander Hover and David Sheek to be then read. The petition read as follows:-

"To the Honorable the Commons House of Assembly, in Provincial Parliament assembled.

"The Petition of Alexander Hover, of the Township of Cornwall, in the Eastern District, Merchant, humbly sheweth that Your Petitioner, in the month of February, one thousand eight hundred and sixteen, at the particular request of the Commissariat Department and Merchants of Montreal in Lower Canada, undertook to improve the navigation of the Moulinette in the River St. Lawrence, which was rendered dangerous to boats passing and repassing by the building of certain mills thereon.

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of Assembly of the said Province of Upper Canada, humbly beg leave to state that from our experience in the trade of the Upper Province great delays are produced and great losses are incurred in consequence of the rapids at Moulinette and Mille Roche.

"We also beg leave to express our conviction that the project which the above gentleman has in view of facilitating the navigation, would be, when executed, of incalculable advantage to the two Provinces, and that the said gentleman possesses all the qualifications necessary for the purpose.

"Montreal, 28th January, 1817.

"(Signed) Maitland, Gardner and Auldjo, and sixteen other Companies."

had improved at the request of the Commissariat Department and the merchants of Lower Canada and particularly "at the first suggestion of the House of Gerrard, Yeoyard, Gillespie & Company," the navigation

"The accidents that occurred in this rapid within the last few years to boats of different descriptions, and the severe losses experienced by many of the merchants of Montreal in the transportation of their stores to Upper Canada, rendered some exertion to prevent a continuance of these disasters absolutely necessary.

"Your Petitioner, at the first suggestion of the House of Gerrard, Yeoyard, Gillespie & Company, volunteered his services: he afterwards received the patronage of Government and all the merchants embarked in the trade with Upper Canada.

"The Moulinette Rapid, before the erection of the mills, etc., by Mr. Dickson, was provided with a channel perfectly competent to admit a free passage to boats of any size commonly made use of by the Canadians.

"These mills have been built immediately in the bed of the Batteaux Channel, and to raise a head of water sufficient to put them in motion, a dam has been extended across the river within about forty-five feet of the island opposite.

"By this means the whole body of the St. Lawrence which flows between the north shore and the island, runs through a place of about forty-five feet in breadth, and through this channel crafts of all dimensions were formerly compelled to pass.

"The current occasioned in this place by the obstruction of the water flows with such rapidity that a loaded boat cannot be brought up by the crew.

"It was therefore necessary to discharge the load and carry it by hand above this place.

"Immediately below this passage is situated a large rock, over which the water pours with such impetuosity that in the event of the boat breaking away from the teams employed in hauling them up they inevitably drift upon this rock and are stove.

"The improvement which Your Petitioner has made in this rapid is the building of a lock at the distance of about one hundred and thirty feet from the

of the Moulinette Rapids in the St. Lawrence River by building a lock for the passage of boats. This lock was constructed about one hundred and thirty feet distant from the north shore, and of such dimensions that boats "passed with perfect safety" in about eight minutes; while formerly it sometimes took two to three days to transport by land around the rapids. For this improvement he had expended between £ 200 and £ 300.¹

1. Cf. Journals of the House of Assembly, Upper Canada, for the Year 1817. (6th March, 1817.)

"Mr. Robinson first named of the Select Committee

north shore. Through this lock boats of all dimensions have during the last year passed with perfect safety, and instead of being delayed for one, two or three days (which formerly was frequently the case), the difficulty in surmounting this rapid is now effected in the space of eight minutes.

"The annexed certificates from the most respectable merchants of Montreal will be sufficient to prove of how much importance the lock which Your Petitioner has erected has been to the public.

"Your Petitioner is informed that Adam Dixon, the proprietor of the above mentioned mills, has applied to this Honorable House for the right to possess the said Moulinette Rapid for the purpose of extending the improvement now made.

"But Your Petitioner, having been the first to step forward and tender his services, and having expended between two and three hundred pounds in rendering the rapid so much more navigable than it was heretofore, humbly prays of this Honorable House permission to retain possession of the lock now upon the said rapid, and to make such other improvements as to Your Petitioner may seem necessary, until such time as the Government shall find it expedient to take the improvement of the navigation of the St. Lawrence under their immediate inspection.

"And Your Petitioner, as in duty bound, will ever pray.

"22nd February, 1817.

"ALEXANDER HOVER"

Later he sought permission to build a temporary lock at Mille Roche and to put into effect a toll charge of five shillings for each boat passing through the same.¹

1. Cf. Journals of the House of Assembly, Upper Canada for the Year 1817. (7th March, 1817.)

"Mr. McMartin, seconded by Mr. Cameron, moved that the Petition of Alexander Hover, of Cornwall, Merchant, be now read, which was carried and the Petition read as follows:-

"To the Honorable the House of Assembly, in Provincial Parliament assembled.

"The petition of Alexander Hover, of the Township of Cornwall, in the Eastern District, Merchant, humbly sheweth,

"That Your Petitioner, in the beginning of the year one thousand eight hundred and sixteen, erected a lock on the Moulinette Rapid, by which navigation of the rapid was greatly improved, as will appear by sundry certificates annexed to a certain Petition presented to this Honorable House in the beginning of its Session.

"That the rapid known by the name of the Mill Roches is the cause of much difficulty to boats in their passage up the St. Lawrence.

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to inquire of the improvement in the St. Lawrence Navigation, presented his Report, which was ordered to be received, as follows:-

"Agreeably to the order of this Honorable House the Committee to whom was referred the examination of what improvements have been made in the River St. Lawrence the preceding year, report that they have given that subject due consideration. They find that Alexander Hover has erected a lock at the Moulinette which, with other improvements, has cost him three hundred pounds; that during the last summer he had received five shillings for each boat passing.

"It appears to Your Committee that Alexander Hover, from being the only person who had made any improvements in the Navigation of the St. Lawrence, is entitled to the consideration of Your Honorable House.

"P. Robinson,

"Chairman of the Committee."

His petition was introduced in the House of Assembly on 7th March, 1817.

David Sheek also made representations¹ to the House

1. Cf. Journals of the House of Assembly, Upper Canada, for the Year 1817 et seq. (24th February, 1817).

"To the Honorable the Representatives of the people of Upper Canada in General Assembly.

"David Sheek, of Cornwall, in the Eastern District, humbly represents that the rapid waters at Mill Roche and Moulinette in the River St. Lawrence are a great hindrance to the navigation of that river in the only passage from Lower to Upper Canada.

"That Your Representor had, during the late war, concerted with the Engineer and Quarter-Master General the erection of a lock which should remove all obstructions in either of those passages, and render the communication safe and expeditious; but the Peace intervening the project was not effected.

"That in its progress surveys and plans have been made at considerable expense, and Your Memorialist is desirous to complete the locks and canal according to such survey and plan herewith annexed, upon reasonable aid from the Legislature, either by an exclusive right to moderate toll on all boats using the same and prohibition of other locks within the space defined, or by an advance towards the expense of the said locks in the place of toll from all boats in His Majesty's service.

"That by erecting the locks agreeably to this plan, the distance will be shortened upwards of five hundred yards, the whole of which is rapid water, and

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"Your Petitioner therefore humbly craves permission of this Honorable House to erect a temporary lock at the Mill Roches in the Township of Cornwall, and to be allowed the sum of five shillings currency as a toll to be paid by each boat that passes through the same until such time as the Government shall find it expedient to take the improvement of that navigation under their immediate inspection.

"And Your Petitioner, as in duty bound, will ever pray.

"4th March, 1817.

"ALEXANDER HOVER"

of Assembly for permission to undertake the improvements of navigation at Mille Roche and Moulinette, stating that surveys and plans were already made at considerable expense. He attached to his petition a copy of the survey and plan of the proposed project.

The following year (1818) Adam Dixon again petitioned the Provincial Legislature; this time he asked for permission to hold the locks, built by himself at Mill Roche and Moulinette, "exclusively for such a term of years, and under such regulations as to the price to be demanded for the passage of a boat" as in the opinion of the House was deemed proper.¹ This petition was

1. Cf. Journals of the House of Assembly, Upper Canada, for the Year 1818. (19th October, 1818).

"Mr. Van Koughnet, seconded by Mr. Hatt, moved that the Petition of Adam Dixson (sic.) of the Township of Cornwall be now read. Which was carried, and the Petition was read as follows:-

"To the Honorable the Commons House of Assembly of the Province of Upper Canada in Provincial Parliament assembled.

"The Petition of Adam Dixson, of the Township of Cornwall, in the eastern District, Merchant,

"Humbly Showeth: That Your Petitioner has resided

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by removing a few large rocks in the channel at Mill Roche the navigation will be rendered so much easier that three or four men will ascend and descend with a boat with greater ease and safety, and in one-fourth part of the time, than eight or ten men can do in its present state. Which is humbly submitted.

"York, 22nd February, 1817.

"DAVID SHEEK"

On 5th March, 1817, Mr. McMartin, seconded by Mr. Howard, moved for leave to bring up the Petition of Alexander Hover of Cornwall, Merchant, which was granted, and the Petition laid on the Table."

referred to Mr. Archibald McLean of Stormont, who was a member of the House of Assembly, for his investigation and report. On the 7th April, 1821, Mr. McLean, as Chairman of the Committee on Improvements of Navigation, presented in the Assembly the following report:

for many years at Moulinette Rapids, on the River St. Lawrence, in the said district, where he has had daily opportunities of witnessing the very great difficulty and dangers encountered by boats ascending these Rapids with loads. That, with a view of affording assistance to such boats, and at the same time with an expectation of being remunerated, Your Petitioner was induced to build locks at the said rapids in the construction of which he has expended a large sum of money out of his private funds. That previous to the building of these locks Your Petitioner was encouraged to do so by the owner of boats in the lower province, but that since the locks have been completed, though their great utility is acknowledged, some of the boats are reluctant in paying the small sum which Your Petitioner has thought himself justifiable in asking for the attendance of his men in passing through the locks.

"That many of Your Honorable Body have had opportunities of personally seeing and appreciating the advantages of these locks, and will, Your Petitioner trusts, see the propriety of encouraging undertakings of this kind by individuals. That Your Petitioner is prepared, should the prayer of this Petitioner be granted, to give security in any sum which may be required to keep the locks in the best possible state of repair, and to keep men in constant readiness to pass any boats through them.

"He therefore prays that Your Honorable House, taking into Your wise consideration the ease and advantage afforded by these locks to boats ascending the River, and also the expense which has been incurred in building them, will be graciously pleased to grant him permission to hold the said locks exclusively for such a term of years, and under such regulations as to the price to be demanded for the passage of a boat, as to Your Honorable House shall deem proper; and, as in duty bound, he will ever pray.

"Cornwall, September 30th, 1818.

"ADAM DIXSON"

"To the Honorable the Commons of Upper Canada in Provincial Parliament assembled:

"The committee appointed to take into consideration the petition of Adam Dixon, of the Township of Cornwall, merchant, beg leave to report:

"That they have taken the same into consideration and examined several affidavits accompanying and supporting the said petition, by which affidavits it is made manifest to the committee, that the navigation of the river St. Lawrence has been much improved at the Moulinette Rapid and its vicinity, by the erection of a mill dam, and subsequently by a lock to admit of the passage of boats into the mill pond, the water being raised by such dam so much, as to make the ascent of a small rapid above Moulinette, formerly very difficult, now very easy, and the lock affording great facility for the passage of boats through the Moulinette Rapid.

"The committee are of opinion, that the said Adam Dixon ought to receive Legislative encouragement in maintaining and repairing the said locks, so far as to authorize him to exact a certain toll from all boats passing through the locks according to the tonnage of such boats: provided he shall make it satisfactorily appear, that a channel is yet open by which boats may, if their owners think proper, ascend the Moulinette Rapid as easily and expeditiously as before the erection of such mill dam and locks respectively: provided also, that he shall give security to keep such locks in proper repair, and have a sufficient number of men in attendance, to pass boats through them without unnecessary delay."

In 1818 the subject of better water communication between the two Provinces was vigorously dealt with by the Joint Commission appointed by the Governments of Upper and Lower Canada who were to investigate and report on the navigation of the upper St. Lawrence. The commissioners, in their report dated the 15th September, 1818, recommended that canals not less than four feet

deep be constructed without delay so as to compete with the Great Western Canal (Erie) then being built in the State of New York. Although nothing was done, due principally to a lack of revenue with which to prosecute the project, the subject was not allowed to lapse. Several reports were made: Robert Nichol, the Chairman of the Select Committee on Internal Revenues, submitted one on 31st March, 1821, in which he recommended that the House of Assembly should pass a bill for the appointment of commissioners with power "to devise and adopt such measures as shall be requisite to facilitate and effect a communication by canals and locks between the lakes Erie and Ontario, and lake Ontario and Montreal."¹

The commencement of work on the Lachine Canal in 1821 by the Government of Lower Canada did necessarily

1. Vid. Mr. Nichol's report in footnote No. 1, pp. 70-75 supra. The Canal Commissioners' Bill was read a third time on the 13th of April, 1821; it was passed, signed, and intituled "An act to make provision for the improvement of the Internal Navigation." The Lieutenant Governor, in his speech at the closing of Parliament on 14th April, 1821, made the following remarks:

"The bill for appointing commissioners to ascertain and report on the improvement which can be effected in the internal navigation may be considered as the commencement of an important undertaking eminently calculated to advance the prosperity and greatness of Upper Canada."

point out what ought to be done in the Upper Province, even if the difficulties experienced in obtaining supplies and moving military stores and troops during the War of 1812 had not inadvertantly enforced some positive exertion. In the same year the Earl of Dalhousie made a tour of inspection to the Western Frontier, accompanied by Lieutenant Colonel (Frans.) Cockburn, Deputy Quarter Master General to the Forces, who made observations as to the length of time required to navigate the Saint Lawrence in its natural state with portages at points where the rapids were insurmountable by loaded canoes. Extracts from his report are reproduced in Table IV on the following page. By these observations it was attempted to show that improvements in navigation were necessary in order to make possible quicker communication with the forts on the Western Frontier.

In 1825 an address was voted by the Legislative Houses of Upper Canada asking the Lieutenant Governor to instruct the Surveyor General to furnish a map of the River St. Lawrence in the Johnstown District - which would be of the vicinity of the Long Sault Rapid. In December, 1826, Mr. Samuel Clowes made a report¹ which

1. Sir James Carmichael Smith directed in his letter, dated 14th March, 1826, to General Marm, that Lieutenant Colonel By obtain the surveys and estimates laid

TABLE IV

"Observations made in the year 1821 by Lieutenant Colonel (Frans. Cockburn, Deputy Quarter Mr. Genl. to the Forces when in attendance on His Excellency Lieut. General the Earl of Dalhousie, G.C.B., on a tour of Inspection made by His Lordship to the Western Frontier of this Command:"

	Miles	TIME		REMARKS
		Hours	Minutes	
Montreal to LaChine	9	1	15	By Land (Upper Road the best).
Cascades	18	4	30	In loaded canoes.
Coteau du Lac . . .	15	5	0	Canoes unloaded and the baggage carted past. It being rapids nearly the whole way.
Mr. Donald's Point .	3	1	10	Rapids, swift water all the way
Point au Bodet . . .	7	1	35	Still water - canoes loaded.
Grant's Tavern (late Somers)	16	3	..	Still water.
Cornwall	10	2	15	Current nearly the whole way.
Fort Wellington . .	50	17	..	Canoes quite light (baggage in wagons) having the Mill Roche, Moulinette, Long Sault, Rapide Plat & Gallops Rapids to pass.
Gananoque	45	10	..	Strong current in some places.
Kingston	18	3	30	Still water.
Total to Kingston . .	*191	48	..	In Canoes.
				If pressed for time, a canoe moderately loaded as to baggage with three or four settlers in the middle and two servants might perform this part of the journey in four days, going
				1st day to Pt. au Bodet.
				2nd day to Mille Roche.
				3rd day to Fort Wellington
				4th day to Kingston.
Total Kingston to York	180	32	..	The baggage must of course be carted past the worst of the rapids, and the lighter the canoe the more certain she would be of keeping her time.
Fort George	30	6	..	Canoes carried in the steam-boat. It would, however, take four days for canoes to go round the Lake from Kingston to York.
Total from Kingston to Fort George	210	38	..	

* Exclusive of the 9 miles, the total should be 182 miles.

he submitted to the Lieutenant Governor who in turn laid the same before the Parliament on the 30th of the same month.

As a result of this information, steps were taken to determine the probable cost of overcoming by artificial navigation the difficulties impeding travel. Two estimates were submitted for consideration: one for a Canal 84 feet wide at the top, 60 feet at the bottom, 8 feet in depth of water, with locks 142 feet long by 40 feet wide, and to be completed by an expenditure of £ 166,378, 8s, 5d; the other for a Canal 38 feet wide at the top, 26 feet wide at the bottom, 8 feet in depth of water, with locks 100 feet long by 15 feet wide, and to be built for an estimated outlay in capital of an amount of £ 91,835, 1s, 11½d. The plans called not for a continuous canal channel, but for a route which was to turn in and out of the river.

From the time these estimates were rendered there was a party in the Provincial Legislature which kept the project steadily before the House. The subject was never allowed to lapse, but was brought up from time to time for discussion; and when Commissioners were finally

before the Legislature of Upper Canada, "drawn up by a very able practicable civil engineer, Mr. Samuel Clowes."

appointed to confer with the Canal Commissioners of Lower Canada, it was considered that the proposed project would become in the immediate future a reality.

At this juncture, however, the real impulse came in 1830 from the town of Brockville, Ontario, whose commercial life was threatened with extinction by the construction of the Rideau Canal. This canal was built as a connection between the Ottawa and the Rideau Rivers so as to reach Kingston by way of Ottawa; it was built primarily for military reasons.¹ Its construction, nevertheless, caused a temporary abandonment of the St. Lawrence River route which action drew traffic and commerce away from the town of Brockville, much to its detriment. So alarming did the commercial situation become that Brockville authorities called a meeting to consider means for alleviating their plight. At this meeting a sum of £ 60 was subscribed for a preliminary survey of the ground between Cornwall and Dickinson Landing, and in the interests of the project it was determined to petition the Legislature to continue with the improvement. The petition was presented, and a report was made thereon that unless the Provincial Legislature of Lower Canada undertook the improvement of

1. Cf. Brymner, *op. cit.*, 1890, pp. xxviii-xxxi. Vid. also p. 151 *supra*, note 1.

navigation, then impeded by rapids, within that Province, nothing would be gained by effecting a better route in the upper reaches of the St. Lawrence whereby steamboats might go below Prescott.

It was then proposed that the Legislature pass an Act incorporating the petitioners into a Company, with an authorized capital of £ 50,000, and having a provision that if circumstances warranted the capitalization could be extended to £ 200,000. The whole subject was earnestly recommended to the Provincial Parliament, where, on the 11th March, 1831, the question was seriously debated. A resolution was determined upon to the effect that the navigation should be for sloops and steamboats, and that the Lieutenant Governor should be requested to seek permission from the Governor General allowing a survey, at the expense of the Legislature of Upper Canada, to be made of the rapids above Lachine. Another resolution was voted at the same time, that the permission should be asked without any unnecessary delay.

In the following year a Select Committee was appointed, who reported that a Canal surmounting the natural barrier set up by the Long Sault Rapids would permit steamers to ply westward from the boundary line of

the Upper Province; they also strongly recommended that Canal Commissioners should be directed to undertake an investigation for the purpose of obtaining an estimate of the cost, and that £ 50,000 should be advanced so that the Commissioners may commence work at the "Longue Sault" immediately after they had obtained their information.

The Select Committee's Report was given much thoughtful consideration and a resolution was introduced into the Assembly that the public interests required that the St. Lawrence should be improved sufficiently to admit vessels with a draft of 8 feet of water, and that the improvement should be commenced at the head of the Long Sault Rapid as soon as possible. Attempts were made in the House to limit the navigable depth to 5 feet, but the main proposition favoring the construction of a canal with a depth of nine feet was passed by a vote of 20 to 6, and an appropriation of £ 70,000 was granted for immediate commencement of the work. Three Commissioners were appointed in 1833 to carry out the project. No time was lost by these men in entering upon the examination of the probable cost.

The suggested improvements contemplated not only

a Canal around the Long Sault Rapids, but also canals to surmount the rapids at Farran's Point, Rapide Plat, Galops, Cardinal and Point Iroquois. Two engineers, Benjamin Wright and John B. Mills were engaged to make a report, and they submitted plans not only for the Cornwall Canal but in addition for Canals, commonly known as the "Williamsburg" group, involving in all an estimated expenditure of £ 328,615, 1s. In December, 1833, the Commissioners submitted a report stating that they had caused the necessary surveys to be made, and careful estimates of the cost of constructing the canals to be prepared, and also had made arrangements for the immediate commencement of the proposed work.

The Cornwall Canal was accordingly begun in 1834, the first sod having been cut with pomp and ceremony by Sir John Beverly Robinson. The work was vigorously prosecuted until the outbreak of the rebellion in 1837, which, together with the financial depression, caused a complete cessation of building operations for some years. Construction was resumed, with that of other public works, in 1842, and the Canal finally completed¹

1. Cf. Report of the Board of Works, Montreal, December, 1844, p. 6; (Mr. Killaly, President of the Board).

"To avoid these serious, indeed they may more properly be styled insurmountable obstacles to the trade, the

in 1844. During the latter part of the year 1842, the steamboat "Highlander," Captain Stearns, passed through the locks, and the event was observed with some ceremony.

Cornwall Canal was commenced and to a great extent constructed under the Commissioners appointed previous to the establishment of the Board of Works. Under the control of the latter it has been completed.

"In my last report, I stated the extent to which expenditure upon the repairs, and strengthening of the embankments had been necessary in order to insure the uninterrupted use of the canal. I am glad to be able to state that the season has passed over without any stoppage in the navigation having taken place, and I trust that due attention, and a continued, but very much reduced outlay in strengthening a few parts of the banks which require it, that no further breaches will occur. In the very low water, some obstruction was experienced at the head of the canal from a part of the old Coffey Dam which was not sufficiently removed, this will be attended to, so that no inconvenience will again be caused by it.

"The consideration and audit of various claims for land damages on the line of this Canal has occupied the attention of the late commissioners, with whom this settlement was left by the Act, and those gentlemen having forwarded a schedule of the several claims (very much curtailed by them), to the Provincial Secretary a considerable time since, it is very desirable that no further delay should take place in making provision for their liquidation.

"The completion of the works of this canal, upon its control being vested in this department was estimated at £ 57,670 currency. These works together with some amendments to them found to be indispensable, but not anticipated were accomplished for £ 57,110, but after the Canal was filled and in use for a little time, the breaches which took place, and the indications of giving way which presented themselves in many parts of the old banks, the causes of which, in my judgment, I enumerated in my last Report, rendered expenditure unavoidable.

"This expenditure amounting to £ 9,925, 16s, 4d, was taken from the special appropriation for the Saint Lawrence navigation, but must next year be repaid, when the funds for the payment of the land and sundry contingent expenses generally, are required."

The Canal was opened on the 10th of April, 1843, for navigation. It had six locks, each 200 feet long by 55 feet wide, and 9 feet of water over the sills; these dimensions were the largest of any canal within the two Provinces of Canada until after the Confederation in 1867.

The Canal Commission, appointed on the 16th November, 1870, to enquire into the subject of further improvement in navigation of the St. Lawrence, recommended¹ that "the enlargement of the St. Lawrence Canals to the same scale as the Welland" should be undertaken. Shortly thereafter, the enlargement was begun, giving a depth of 14 feet of water on the sills, but it was not completed until 1900.

The Williamsburg Canals

Five miles upstream from the Cornwall Canal is the first - Farran's Point - of a series of canals generally known as the Williamsburg Canals, which, in addition to the one indicated above, includes those at the Rapide Plat and the Galops. The Canals were originally four in number; besides the three named above, a canal

1. Cf. General Report of the Minister of Public Works for the Year ending 30th June, 1871, pp. 3-4.

also had been built at Point Iroquois but owing to an error in engineering calculations it later had to be connected by the Junction Canal to the one surmounting the Galops Rapids. These canals overcome the natural barriers to navigation set up by the rapids in the St. Lawrence River from which they take their respective names. Their combined length is twelve and a quarter miles, and, including the intervening river reaches, they¹ extend for a distance of twenty-six and a quarter

1. Cf. International Joint Commission, "Report on the St. Lawrence Navigation and Power Investigation," 1921, p. 41 et seq.

Colonel J. G. Warren, United States Corps of Engineers, outlines in a general survey of the channel improvements made in the connecting links of the Great Lakes and the St. Lawrence River the then present condition of navigation in the International section, as follows:-

"For a distance of 68 miles from Lake Ontario to Galops Rapids, the river has a fall at low water of only 1 foot, and the channel is over 30 feet deep, with a minimum width of about 500 feet. This channel is all in the United States waters except for about $7\frac{1}{2}$ miles from Crossover Light through the Brockville Narrows.

"At the Galops Rapids, the river has a fall of about 10 feet in three miles, with two channels having a combined cross section of about 40,000 square feet. The North Channel is in Canadian waters, navigable by light-draft boats only. The South Channel, American Galops Rapids, 4 miles, wholly in United States waters, is not navigable.

"From the foot of the Galops Rapids, at Lotus (Sheldon) Island, to the head of Ogden Island, 8 miles, fall about $9\frac{1}{2}$ feet, the river is confined to a single tortuous channel, consisting of three pools, 30 feet or more deep, separated at Sparrowhawk Point and Rockway Point by narrow channels, controlling depths 20

miles, whence river and lake navigation are possible without further interruption until the Welland Canal is entered two hundred and twenty-eight miles farther westward. The rapids¹ overcome by the Williamsburg

1. Cf. Report of the Board of Works, Montreal, December, 1844, p. 5. (Hamilton H. Killaly, President).

"The first class steam passage vessels can overcome these Rapids, as well as those at Point Iroquois, Rapide Plat and Farran's Point in the natural state of the River, but to enable the trade vessels generally to ascend the Galoppes, improvements are in progress, which consist of one Guard Lock, one lock with a lift of between seven and eight feet, and a lateral cut two miles in length."

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to 25 feet, having maximum current velocities of about 7 miles per hour on curves of 2,000 feet radius. The international boundary practically bisects this channel. The Galops Rapids and Swift-current Channel to Rockway Point are now overcome by navigation through the Galops Canal in Canada.

"From the head of Ogden Island to the foot of Crysler Island (Bradford's Point) - 11 miles, fall about 18½ feet - the river is again divided by islands into two channels. The Canadian Channel is much the larger; the upper 4 miles comprise the Rapide Plat, which are overcome by the Rapide Plat or Morrisburg Canal. The American channel is narrow and tortuous and not navigable except by small steam and motor boats. The counterpart of the Rapide Plat is known as Little River, across which there is a power dam at Waddington, N. Y., 950 feet long, to Ogden Island, height about 12 feet; theoretical development about 15,000 horsepower.

"From Bradford's Point to Richards Bay, 7 miles, fall about 3 feet, the river consists practically of a single wide pool or channel, nearly all on the United States side of the boundary line, 30 to 50 feet deep except at the head of Cat Island, 20 to 23 feet deep. On the Canadian side, within this reach, is found the Farrans Point Canal. Descending vessels run the rapids."

Canals are comparatively slight, and are navigated both ways by fast passenger steamers.

Although the building of these canals was proposed at various times before Upper and Lower Canada were united, in 1840, into one province, their construction was not started until after the Union. Brockville, impelled by the loss of commerce and traffic due to the building of the Rideau Canal and the abandonment of the St. Lawrence route, was amongst the first¹ to campaign for improvements of navigation in this section of the river. The Commissioners² appointed by Upper Canada in 1833 not only contemplated the building of the Cornwall Canal, but also of the four Williamsburg Canals. Work, however, was not commenced until the year 1843, and completion did not take place until 1847. They were built upon the same scale as the Beauharnois Canal, and, as a consequence, a navigable waterway with a 9-foot depth from Lake Ontario to Montreal was provided. The four canals up to 1847 cost approximately \$1,222,904. The recommendation³ of the Canal Commissioners of 1870 included for enlargement these canals; and the work was

1. Vid. p. 184 supra.

2. Vid. p. 187 supra.

3. Vid. p. 92 supra, note 1.

begun after the Government's approval in 1873. However, upon strong representations being made by leading business men in 1874 for a greater depth in the St. Lawrence canals, the Dominion Government in 1875 ordered that the enlarged canals should be deepened sufficiently to pass vessels of 14 feet draft. They were gradually enlarged up to the year 1903.

The Farran's Point Canal: The lowest one of the series is the Farran's Point Canal, the foot of which is five miles up the St. Lawrence River from the head of the Cornwall Canal. It enables vessels ascending the river to pass round the Farran's Point Rapids. Descending vessels run the rapids with comparative ease and safety. From the head of this canal the river is navigable for a distance of ten and a half miles to the Rapide Plat Canal.

The Farran's Point Canal¹ as originally built was three-quarters of a mile long, with one lock, 200 feet long by 45 feet wide, with 9 feet of water on the mitre sills, and a total rise of lockage of 4 feet. Work was commenced on it in the year 1844, and the canal was opened in June, 1847.²

1. Cf. Report of Commissioner of Public Works, (Canada) for the year ending 30th June, 1861, p. 15.

2. Cf. Ibid., 1847, p. 14.

Today the Farran's Point Canal is one and a quarter miles in length, and is provided with two parallel locks: one - the new - is 800 feet long (530 feet between the lower and middle gates, and 270 feet between the middle and upper gates) by 50 feet wide, with 14 feet of water on the lock sills; the other - the old - is 200 feet long (175 feet available length) by 45 feet, with 9 feet depth of water at ordinary level on the mitre sills. The total rise of lockage is $3\frac{1}{2}$ feet; the canal channel is 154 feet at the water surface and 90 feet at the bottom.¹

The Rapide Plat Canal: The second or middle one of the Williamsburg Canals is the Rapide Plat, which extends from the town of Morrisburg to Flag's Bay. Between the head of the Farran's Point Canal and the foot of the Rapide Plat Canal there is a navigable stretch of river for nine and a half miles. This canal facilitates the passage of ascending vessels by the point in the river impeded by rapids. Descending vessels run the rapids with comparative safety unless unusually low-water conditions exist.

1. Cf. U. S. War Department, "Survey of Northern and Northwestern Lakes," Bulletin No. 39, April, 1930, p. 431.

The Canal,¹ as originally built, had a length of three and nine-tenths miles, with two locks, 200 feet by 45 feet, 9 feet depth of water over the mitre sills and total rise of lockage of $11\frac{1}{2}$ feet. Work on it was begun in 1844 and it was opened in September, 1847.

The present canal is three and two-thirds miles long, with a width of 152 feet at the water surface and 80 feet at the bottom, and depth of 14 feet of water on the mitre sills. The total rise of lockage is $11\frac{1}{2}$ feet, provided by two locks, each 270 feet long (255 feet available length) by 45 feet wide. The old lift lock, 200 feet long (175 feet available length) by 45 feet wide, with 9 feet of water on the mitre sills, is also in commission for the accommodation of shallow draft vessels.²

The Galops Canal: Situated about four and a half miles west of the Rapide Plat Canal, the Galops Canal extends from the village of Iroquois to a point about

1. Cf. Report of the Board of Works, Montreal, December, 1844, p. 6. (Hamilton H. Killaly, President).

"These obstructions to the ascent of trade vessels are about nineteen miles below Prescott. The improvements here consist of one guard Lock, one lift Lock of about eleven and a half feet rise, and a lateral cut of about four miles in length."

2. Ibid., p. 430.

one and a half miles above the town of Cardinal, a distance of seven and one-third miles. It surmounts the last series of rapids¹ met with between Montreal Harbour and Lake Ontario, namely: Pointe aux Iroquois, Point Cardinal, and the Galops; and enables vessels to pass these rapids.

The first attempt to improve navigation in the vicinity of these three rapids was made in the year 1843 when the construction of two canals, the Iroquois and the Galops, separated by a distance of two and one half miles, was undertaken.² The Galops Canal was opened

1. Cf. Report of the Board of Works, Montreal, December, 1844, p. 6. (Mr. Killaly, President.) "These rapids are situate at about six miles below Prescott. The current in the River is very strong, varying from six to ten miles per hour."

2. Cf. Report of the Board of Works, Montreal, December, 1844, p. 5. "The Works are all under contract and satisfactory progress generally has been made during the season, impeded however by the turbulent and riotous spirit of the laborers, which has unfortunately been the case upon all the other canals also.

"These Rapids occur at about twelve miles below Prescott. To enable the trade vessels to ascend them, the works in progress are those of a lock and lateral cut, the lift of the former about six feet, and the length of the latter about three miles. The progress has not been to the extent it should have been, but the entire can be completed next year. The quantity of rock to be excavated is greater than the trial pits indicated."

for navigation in November, 1846, and the Iroquois in October, 1847.¹

Owing to a miscalculation in the level at the time of laying the sills of the lock of the Iroquois Canal it was later discovered that an insufficiency of water resulted. This discovery aroused considerable controversy and a fierce attack against those responsible for the mistake was launched by the Montreal journals.

To remedy the deficiency it became necessary to join the Galops and Iroquois Canals by building the Junction Canal and thus raise the level of the intervening reach. By the fall of 1856 it was so near to completion that vessels could pass through; the following year it was completely finished. The cost of the engineer's error was \$211,231.33, in addition to which must necessarily be applied the annual charge for maintenance of the Junction Canal during its useful life. These three canals, having a combined length of seven and one-third miles, form what is now called the Galops Canal.

As originally built the combination had an aggregate length of seven and five-eighths miles, with a

1. Cf. Report of the Board of Works, Montreal, December, 1844, p. 5.

bottom width of 50 feet, and provided with five locks 200 feet long by 45 feet wide, depth of 9 feet of water on the sills, and a total lockage lift of $15\frac{3}{4}$ feet. These canals were subsequently dredged to a depth of 14 feet in conformity with the Government's adopted plan of 1875, the enlargement being practically completed by 1903.

Today the Galops Canal has the following dimensions: length, 7.33 miles; breadth of canal at surface of water, 144 feet; breadth of canal at bottom, 80 feet; number of locks, 3. The dimensions of the locks are as indicated herewith: Lift Lock No. 25, at the easterly end of the canal at Iroquois and overcoming the total drop of $15\frac{1}{2}$ feet, 700 feet long (530 feet between lower and middle gates, 270 feet between middle and upper gates) and 50 feet wide; Guard Lock No. 27, nearly one mile upstream from the head of the original Iroquois Canal but east of McLaughlin's Point, 270 feet long (available length 255 feet) with 45 feet width at bottom and 46 feet 10 inches width at top; Lift Lock No. 28, connecting with the river at the same place as No. 27, 303 feet long (270 feet between the lower and middle gates, 33 feet between the middle and upper gates) with width of 47 feet 4 inches at top

and 45 feet at bottom. The controlling depth in all three locks is 14 feet over the sills. Lock No. 28 enables descending vessels to enter the St. Lawrence river once more directly at the lower extremity of the Galops Rapids because of the fact that the rapids at Point Cardinal and Point aux Iroquois may be run easily and safely, thus eliminating the necessity of some six miles of canal navigation.

The Welland Canal

The Welland Canal was begun in the year 1824 to overcome the tumbling cataracts of Niagara which, with the accompanying drop in the Niagara River, constitute a difference in level between Lakes Erie and Ontario of about $326\frac{1}{2}$ feet. This insuperable barrier to water communication between the upper lakes and the sea extends for 27 miles across the Niagara Peninsula, and could only be overcome by man with the expenditure of millions of dollars.

In the early part of the 19th century this problem caused much dismay to the military authorities in their efforts to maintain communication with the western strongholds; and the thirty-month period of hostilities with the United States during the War of 1812 brought forcibly to the people of Upper Canada the

necessity of improving the water communication, by way of the St. Lawrence River, Lake Ontario, and the river Niagara, between Montreal and the outlying forts situated along the western frontier.

There were no roads over which heavy articles could be conveyed; much expense, labour, uncertainty, and insecurity was experienced with each particular movement of goods or military supplies. It is reported that the estimated cost of transporting a "single 24-pounder gun" from the city of Quebec westward to Amherstburg was about six hundred pounds Sterling, and that during the winter season of 1814-1815, when Canadian military forces were engaged in repulsing the invasion of the Americans, whose ulterior motive was the annexation of Canada before British aid could be solicited and obtained, private contractors were generously compensated for their assistance. They were fortunate enough in their engagements for the transportation from Montreal to Kingston of governmental supplies, then urgently needed to combat the advancing enemy, to clear a comparatively large profit of something like £ 30,000.

This conflict without a doubt brought emphatically to the attention of military authorities the danger of

interruption during war, and consequently they sought for a route westward other than that by the St. Lawrence River. A proposal was made by Lieutenant Colonel George Macdonell, of the Glengary Light Infantry, and Captain Reuben Sherwood, assistant quartermaster-general of militia and a land surveyor, that the alternative route, which they explored, from Montreal to Kingston by the Ottawa and Rideau Rivers be used. However, during the year 1813 an invasion of the Niagara peninsula had forced the British Commander to transport supplies for the troops at Detroit from the head of Lake Ontario overland to the Grand River and thence to Oxford on the Thames. This portaging brought forth the suggestion of the practicability of furnishing water communication between Lakes Erie and Ontario by means of a canal.

Subsequent to the War of 1812 the uninterrupted and remarkably rapid progress made by the inhabitants of the State of New York in their construction program of building the Erie Canal, then known as the "Great Western Canal," not only elicited much interest from the Canadians but caused them to proclaim extraordinary consternation lest, by better transportation facilities to the southward, a diversion of the commerce of the

lakes would result in the loss of the share then so immensely enjoyed by them. These feelings on the part of the inhabitants were brought to a head by Colonel Robert Nichol, a member of the House of Assembly, who, acting on a joint resolution adopted by a committee of both Upper Canada houses, introduced on the 4th March, 1816, a bill (Inland Navigation Appropriation Bill) "to appropriate a sum of money toward obtaining a correct survey of the inland navigation of this Province." The Bill¹ had particular reference to the different routes for water communication between Lakes Erie and Ontario, and between Lake Ontario and Lower Canada. On the 13th March, 1816, the bill was laid upon the table for three months, but at the expiration of that time no action was taken upon it, and the measure never became law.

Nearly a year later (February 4, 1817), Lieutenant Governor Gore, in his speech at the time of opening the session of the Provincial Legislature, brought the subject again to the attention of the members of both houses of Upper Canada when he made the following statement: "The water communication of the St.

1. Journals of House of Assembly, Upper Canada, 1816, 4th March, 1816. Vid. also pp. 62-63 supra, note 2.

Lawrence River below Prescott is also deserving of your serious consideration." In consequence of his suggestion an appropriation was made for a survey of that particular part of the river.

On the 21st February in the same year Adam Dixon, a merchant of Cornwall, presented a petition to the Legislature praying for authority to construct locks at Moulinette and Mille Roche, as a means of "facilitating intercourse between the two Provinces, particularly at a time when in the neighboring country every effort is made at internal improvements for the purposes of diverting into new channels that trade which we have hitherto enjoyed." This petition had the support of twelve merchants of Upper Canada and seventeen companies of Montreal, including the firm of Maitland, Gardner and Auldjo. Opposition was made to the petition, however, by Alexander Hover in his petition of 22nd February, 1817, in which he pointed out that he had built a lock at Moulinette at the expense of nearly £ 300, and also by David Sheek who had undertaken the survey and construction of a lock at Mille Roche.¹

1. Journals of House of Assembly, Upper Canada, 21st February, 1817. Vid. also p. 172 note 1.

At the second session of the 7th Provincial Parliament a joint address of the two houses of Upper Canada to His Honor Samuel Smith, then administrator of the Government of that Province, was adopted, declaring the improvement of the navigation of the St. Lawrence River from Upper Canada to Montreal to be a subject of "the first importance," and expressing a "desire that concurrent means may be adopted by both Provinces for effecting so desirable an object on liberal and united principles, essential to the interests of each Province in a commercial, and to our Parent Country, in a political view."¹

Commissioners² were appointed by the Legislatures of the two Provinces to gather at some convenient meeting place in a joint conference. James Crooks and Thomas Clark were chosen as delegates from Upper Canada to confer with Joseph Papineau and George Gordon representing Lower Canada, the Legislature of which had voted at the time £ 500 for the purpose of commencing improvements in the river navigation wherever practicable.

Sir Peregrine Maitland, the Lieutenant Governor,

1. Journals of House of Assembly, Upper Canada, 10th March, 1818. Vid. also pp. 63-66 supra, note 1.

2. Ibid., 30th October, 1818. Vid. also pp. 63-70 supra, note 1.

transmitted on the 30th October, 1818, to the House of Assembly the joint report of the commissioners relative to the question of the improvement of the navigation of the St. Lawrence, in which they declared:

"FIRST. That they are fully convinced that no Public undertaking will be more conducive to the progress and prosperity of the agriculture and commerce of both Provinces, to the augmentation of their wealth in time of peace, and to their security and defense in time of war, than by facilitating the communication of their internal Navigation.

"SECOND. To secure to these Provinces the advantages of trade they already possess, it is urgent that no time should be lost in forwarding the work necessary to facilitate such water communication before the United States may have completed their grand Canal from Lake Erie to the Hudson River, in the State of New York, which canal when so completed, will carry to New York the numerous and precious cargoes which would continue to be exported by the Province of Quebec if both Canadas availed themselves of the means they have to carry the same at a smaller expense and in a shorter time by the natural outlet of the St. Lawrence."

They unanimously agreed to recommend to their respective Legislatures that it was necessary that "canals and locks should be constructed of the same dimensions in the one as in the other so that vessels of the same description may pass through the whole," and that their construction should be prohibited by law in cases where plans called for locks smaller than those of "the Great Western Canals in the State of New York."

A recommendation was also made by the two commissioners for the Province of Upper Canada for the early

appointment from each of the interested Provinces of commissioners "with adequate means to act in conjunction for procuring with all possible dispatch accurate surveys, both of the St. Lawrence and Ottawa Rivers, together with estimates of Canals and Locks for boats and vessels of different constructions, to be laid before the two Legislatures for their selection and approval."¹

Less than a week (4th November, 1818) after this report had been presented to the Legislature of Upper Canada Mr. Clench, a member of the Assembly, moved that a petition² from the inhabitants of the District of Niagara be read. It stated:

"The Petition of the Inhabitants of the District of Niagara -

"Humbly sheweth: That Your Petitioners, viewing the great benefits these provinces will derive from having a Canal made between Lakes Erie and Ontario, have examined the Report on levelling the land between Chippewa and the source of the Twelve Mile Creek, and have every reason to believe a communication can be effected at a trifling expense, from the accompanying plan which will be submitted to Your Honorable Body. From the source of the Twelve Mile Creek where the excavation will end, to the brow of

1. Journals of House of Assembly, Upper Canada, 30th October, 1818. Vid. also pp. 63-70 supra, note 1.
2. Ibid., 4th November, 1818.

the Mountain at Captain Du Coo's is a gentle descent; not a lock will be necessary; after descending the Falls it will be necessary to make Locks to pass four or five Milldams, and the navigation will be complete for boats to Lake Ontario.

"The grand object of the American people appears to be opening a navigation with Lake Erie, which design our canal, if effected soon, would counteract; and take down the whole of the produce from the Western country.

"Your Petitioners therefore beg that you will appoint some scientific men to view the country between Chippewa and Lake Ontario, and adopt such measures for carrying the above objects into effect as you in your wisdom may deem meet."

This petition, dated at Niagara the 14th October, 1818, was signed by Thomas Dickson, Chairman of the Quarter Sessions in Sessions, and 74 other persons.

A committee of the whole House considered the petition, and they in turn referred it to a select committee of four members, of which James Durand was chairman, as "containing matter of great national importance."¹ But there was practically no revenue available for the accomplishment of the work prayed for in the petition, and the Province was without credit on which to borrow for the undertaking. For these reasons the special committee could not take any definite action, and were obliged to confine their report to expressions of sympathy with the proposition. Their report stated:

1. Journals of House of Assembly, Upper Canada, 6th November, 1818.

"That it is the opinion of Your Committee that a canal cut agreeably to the plan proposed by the Petitioners alluded to would be of great benefit to the Commercial Interests of this Province, and ought to be encouraged by every means of furtherance by Your Honorable House.

"And Your committee are further of the opinion that should any number of persons be disposed to associate themselves for the purpose of carrying such a project into execution, it would comport with the true interests of this Province to give to such an incorporated body the authority and sanction of law, and to provide for their obtaining the use of such lands as may be required for the cutting of the said canal in a manner similar to that already pointed out by the Statute for the improvement and altering of Highways and Roads throughout this Province."¹

On the 31st March, 1821, a select committee of eight members, appointed to consider the Internal Resources of the Province, submitted a lengthy report in which they recommended that commissioners be appointed to devise measures for facilitating water communication by means of canals and locks between Lakes Erie and Ontario, and Lake Ontario and Montreal; to determine the best route for such canals; to estimate the cost of construction; and to suggest ways by which the work could be accomplished.

Their report was adopted by the Legislature and an Act passed on 13th April, 1821, for the appointment

1. Journals of House of Assembly, Upper Canada, 17th November, 1818.

of Commissioners to carry out the recommendations. His Excellency, Sir Peregrine Maitland, the Lieutenant Governor of Upper Canada, on proroguing the Parliament on 4th April, 1821, declared in his speech that this bill "may be considered as the commencement of an important undertaking eminently calculated to advance the prosperity and greatness of Upper Canada."¹

The appointed commissioners were Mr. John Macaulay, a member of the Legislative Council, and Messrs. James Gordon, Charles Jones, and Robert Nichol, all members of the House of Assembly. This commission engaged Messrs. Samuel and James Clowes as engineers, and Mr. Reuben Sherwood as land surveyor. In the summer of 1823 this group explored a route from Kingston to the Ottawa River and prepared an estimate of the cost for construction of a canal 125 miles in length, 7 feet in depth, 61 feet in width at the water surface, and 40 feet in width at the bottom. They also surveyed the ground and prepared estimates for a canal to provide water communication between Lake Ontario and Burlington Bay with the ultimate establishment of a "safe and

1. Journals of House of Assembly, Upper Canada, 14th April, 1821.

commodious" harbour at the head of Lake Ontario; it was presumed that a proper solicitation might bring forth financial assistance from the Admiralty. Both of these reports bear the date of December 20, 1823.¹

Meanwhile Mr. William Hamilton Merritt and his associates, who had been for some time agitating the question of better water communication facilities, took up a subscription to employ an engineer to survey the route across the Niagara Peninsula, which they had proposed. Mr. Hiram Tibbett, who had been engaged in making a survey for a canal around the Niagara Falls on the New York side of the river, was employed for the purpose, and he pronounced the route from the Chippewa Creek to the west branch of the Twelve Mile Creek as practicable. Estimates were made for a canal capable of accommodating large boats, which were to be conveyed over the high ridge of land separating the watersheds by wooden railways, and for the provision of water-power which would furnish power for the mills by the Twelve Mile Creek. The engineer reported that the whole expense of the route, exclusive of the railways,

1. Report of the Commission on the Improvement of Internal Navigation, Colonial Office Records, Q335-2, pp. 299-323.

1. Journals of House of Assembly, 1823-24, 10th May, 1823.

would be \$34,550, and that boats of twenty to forty tons could navigate with ease from Lake Ontario to Chippewa in a day or a day and a half at the farthest. He estimated that the railways would probably cost from \$3,000 to \$5,000.

On the 10th May, 1823, a petition¹ was made to the Provincial Legislature for the passage of an act of incorporation authorizing nine leading gentlemen to form a company to carry out the construction of the proposed canal, and railways to be operated by water-power. This petition was favorably received, and on the 19th January, 1824, the Legislature passed an act (Act of 4th George IV) intituled "An Act to incorporate sundry persons therein mentioned under the style and title of the Welland Canal Company, whereof certain of the original petitioners being then and there present." By this act George Keefer, William Chisholm, George Adams, Joseph Smith, John Decow, Thomas Merritt, Paul Shipman, William Hamilton Merritt, and others were incorporated under the name of the Welland Canal Company, which was to have a capital of £ 40,000 divided into 3,200 shares of par value of the sum of £ 12, 10s each. The work was commenced on the 30th November, 1824.

1. Journals of House of Assembly, Upper Canada, 10th May, 1823.

Soon after the incorporation Mr. William Hamilton Merritt left on a tour to York (Toronto), Montreal, Quebec, and the State of New York to secure subscriptions to the stock of the Company.¹ He obtained about

1. Cf. Ontario Historical Society, "Papers and Records," Vol. XXII, pp. 76-77.
"Welland Canal.

"In conformity with a notification previously given by John Stewart, Chairman of the Committee of Trade, a general meeting of the Merchants and other inhabitants of Quebec was this day held at the Exchange Reading Room for the purpose of taking into consideration a communication relative to a contemplated Canal in Upper Canada, to be called the Welland Canal.

"The Honble. J. Irvine was called to the Chair.

"The following Resolutions were proposed and unanimously concurred in:

"1. Resolved.- That this meeting views with great satisfaction the proposed undertaking by our fellow-subjects in Upper Canada of a canal communicating between the Waters of Lake Erie and Ontario to be called the Welland Canal.

"2. Resolved.- As the opinion of this meeting that the Welland Canal when in operation would tend to draw forth the commercial and Agricultural resources of the extensive interior of the Upper Province and become the means of preserving to the Canadas a valuable trade which without such a Channel of communication would be lost to these Provinces and pass to the United States.

"3. Resolved.- As the opinion of this meeting that the completion of the said Canal is an object of the first importance and would be productive of the greatest benefit and advantage to the commerce of the country - not less to this Province than to that of Upper Canada.

"4. Resolved.- As the opinion of the meeting that the said undertaking merits every encouragement, and the aid of every inhabitant of this Province who feels an interest in the agricultural and commercial prosperity of the Canadas.

"Resolved.- That Books be immediately opened for the purpose of receiving the subscriptions of those persons who are or may be desirous to become Stockholders

Trist of Quebec, viz., Capt. Frear, Mr. Jackson Stewart,
Mr. Andrew Patterson, Mr. Jamieson and Mr. Irvine.

£ 10,000, the first thousand pounds being subscribed by residents of Quebec City. Mr. J. B. Yates of New York, one of the promoters of the Erie Canal, was the largest stockholder, having at the outset subscribed for 600 shares amounting to £ 7,500, and later taking an additional 100 shares.¹

1. Cf. Ontario Historical Society, "Papers and Records," Vol. XXII, p. 81.

"A summary of the List of Stockholders in the Welland Canal Company, in the year 1825, giving their names and residence, the number of shares held by each, and the total amount of the subscriptions, for which each individual stockholder was liable.

"1825

"Welland Canal Office.

"St. Catherines.

"New York

"Shares

Amount

1125

5 14.062

J. B. Yates held 700 shares, amounting to £ 8,750

Thomas Dixon held 200 shares, amounting to £ 2,500

"Quebec

344

₪ 4,300

The Earl of Dalhousie and the Hon. James Irvine had each taken 20 shares, amounting to £ 250.

in the incorporated Company styled the Welland Canal Company.

"Several subscriptions were then put down, amongst the first was Colonel Johnson of H.M. 68th L.I. Regt., who honoured the meeting with his presence, and who is intimately acquainted with the locality of the situation through which the Canal is to run.

"It was then resolved that with a view of carrying into effect the object of the foregoing resolutions, it is highly expedient and desirable that a committee of five gentlemen be appointed to assist the exertions of Wm. H. Merritt, Esqr., the gentleman who has been named as General Agent from Upper Canada to visit this Province for the purpose of obtaining subscribers to the Welland Canal, and that the following gentlemen be requested to Act as the Committee for the City and District of Quebec, viz., Capt. Freer, Wm. Johnson Stewart, Mr. Andrew Patterson, Mr. Jamieson and Jno. Irvine."

The first idea of the route was to run up the natural waters of the Welland River or Chippewa Creek, and then by a canal four feet deep, and sixteen feet bottom, from the Welland River to Lake Ontario, suitable for boats of less than forty tons burden. The route of the canal was to pass across the township of Thorold, tunnelling through the high ridge of land (about a mile and a half wide) separating the two watersheds, and then proceeding direct to the brow of the high land. The latter was to be descended and overcome by an inclined railway, from the termination of which, connection, by means of another canal, was contemplated with the navigable waters of Twelve Mile Creek, from which entrance could be obtained to Lake Ontario. The upper reach of this proposed canal was to obtain its supply of water from the Welland River.

After incorporation the company, in 1824, engaged three new engineers to revise the project, and

Montreal, 185 shares	£ 2,312. 10s
Kingston, 19 shares	237. 10s
York, 139 shares	1,737. 10s

Hon. J. H. Dunn took forty shares, amounting to £ 500.
Amherstburg, 18 shares £ 225
Niagara District, 816 shs. 10,200
Andrew Harvey, the contractor, took 200 shares, £2,500
Eight of the Niagara subscribers, holding sixty shares, £ 750, have refused to pay their subscriptions.

"JAMES GORDON,

"Treasurer."

the ceremony of breaking the first ground was held by the Commissioners of the Welland Canal on the 30th November of the same year.

However, public agitation¹ was pressing for a canal of larger capacity than originally planned; and as a consequence a new scheme was adopted in 1825 providing for one with a tunnel fifteen feet wide, fourteen feet high and eight feet of water, and with locks 110 feet long, 22 feet wide, and 8 feet depth of water. The route of the canal via the Welland was considered objectionable and although retained, a new one was conceived and adopted. It was to run from Lake Ontario to the Welland River, which was to be utilized as far as its outlet into the Niagara River, eighteen miles from Lake Erie. Vessels could then sail up against

1. In the report of the "President and Directors of the Welland Canal Company, of the Progress and State of the said Canal," Mr. George Keefer, the President, on 1st February, 1825, made the following statement:

"The original plan of this canal was a nine feet wide tunnel, eight feet lock, and sixteen feet bottom. The propriety of enlarging it to fifteen feet wide, fourteen feet high and eight feet water, the size of the Erie Canal was suggested to us and has been adopted with the general concurrence of the Stockholders; the advantage of this is apparent, especially from our proximity to the American Canal, as Boats from thence may pass through this Canal, without the inconvenience and expense of shifting cargoes."

the swift current of the Niagara and out upon Lake Erie. The general section of the canal was to be built 26 feet wide at the bottom and 58 feet wide at the water surface, except in that part which passed through the high land separating the watersheds and known as the "Deep Cut," in which there was to be a minimum width of 15 feet at the bottom.

The importance of the project about that time was attracting the attention of the public and it was found that the original capitalization of the company did not sufficiently provide an amount of stock with which to obtain funds for the prosecution of the contemplated work. Consequently the directors petitioned the Provincial Parliament for an increase in capital from £ 40,000 to £ 200,000; this was granted on the 13th day of April, 1825, when the Legislature amended the Act of 4th George IV by the Act of 5th George IV granting to the Company an amendment to their charter.

Subsequent to this event financial difficulties caused the company to seek aid from the Provincial Government, and because of the importance of the canal, it was readily forthcoming. The Government of Upper Canada assisted with a loan of £ 250,000 and in addition subscribed for £ 50,000 of the unissued capital

stock; the Government of Lower Canada subscribed for £ 250,000; and the Government of Great Britain contributed a sum of £ 16,350, besides giving a grant of 13,400 acres of the waste lands of the Crown in the township of Wainfleet on the condition that all government vessels and stores would be allowed thereafter to pass and repass free of toll charges.

With this financial aid the work was vigorously pushed forward, diversified occasionally by the failure of contractors and the resultant arbitrations, and it was expected that the canal would be formally opened for navigation in 1828. However, various difficulties beset the company, impeding their progress with the work. The difficulty of prime importance to the company in 1828 was its financial embarrassment. The amount in the treasury was little more than £ 21,000 while the estimated amount necessary for completion of the proposed canal was placed at £ 90,000. Very little encouragement was obtained from the Provincial Legislature, and an appeal was made directly to the Imperial Government for an advancement of £ 50,000 Sterling. This loan was made to the Company after security had been given of the tolls, funds, and all property of the Company, and it was subject to an annual interest charge of 4%.

Another difficulty confronted the company in the nature of a discouraging event which took place on the 9th November of that same year, when, with only about two weeks' time required before everything would be in readiness for letting the water in, a landslide occurred at the "Deep Cut." This cut was one and three-quarter miles long through a ridge of clay resting upon an insecure bottom, and had been excavated to a depth of from 30 to 56 feet without the engineer taking any precaution to prevent the banks from caving in. Nevertheless, the company was undeterred and immediately set about to surmount the effects of the slide. This was done by raising the level of the canal; the water for this purpose was obtained by means of a feeder twenty and three-quarter miles long from the Grand River instead of taking it from the Welland River. The feeder itself was a navigable canal with 5 feet depth of water and 40 feet width at the water surface. In order to secure the water for the feeder it was necessary to build a dam across the Grand River near its mouth.

Having overcome this obstacle, they proceeded diligently toward the completion of the canal, which was accomplished a year later, and despite the early winter

it was formally opened in November, 1829. The season was so late that navigation was practically closed, and it required special effort on the part of the directors themselves to make arrangements for two schooners, the "Anne and Jane" of Youngstown, New York, and the "R. H. Boughton" of York, to pass through the canal. These vessels started November 27, 1829, from Dalhousie en route through the canal, and after cutting through ice, which in some places was three inches thick, they arrived at Buffalo on December 2nd of the same year. This achievement was a sign of the realization of the promoters' dream, as it meant that vessels of $7\frac{1}{2}$ feet draft and $21\frac{1}{2}$ feet beam could sail from Lake Ontario a distance of sixteen and one-half miles of canal, ascending 34 locks, and pass down the River Welland to the Niagara. The route of the navigable canal of that day was of the following description: nearly a quarter of a mile west of the entrance to the Welland River the Canal commenced and thence lead into that river, whence for a distance of nine and a half miles, ascending two locks, it ran to the "Deep Cut;" at this point the main canal began, the feeder of which, as mentioned previously, was the Grand River which was carried by an aqueduct across the Welland; from the "Deep Cut" the canal descended to Lake Ontario.

The partial completion of the Company's plans was not entirely satisfactory because of the accumulation of ice each spring which blockaded the portion of the Niagara River from the point where the Welland entered it to Lake Erie for several weeks after Lake navigation opened. Other great inconveniences were caused by the swift waters of the Niagara River and by the considerable distance vessels, coming from the head of Lake Erie, had to sail around the Niagara peninsula in order to gain entrance to the canal. For these reasons it was decided to adopt the original plan of connecting the canal with Lake Erie at Port Colborne and a petition was made to the Legislatures of Upper and Lower Canada praying that each provide \$100,000 to carry out this purpose.

On the 14th March, 1831, an Act to afford further aid in the construction of the Welland Canal was passed, authorizing the Receiver General to issue debentures to the amount of \$200,000 as a further loan. The capital stock of the Company was increased from £ 200,000 to £ 250,000, and in 1833 another Act was passed for affording further aid towards the completion of the Welland Canal, appropriating \$30,000 to subscribe for the unissued capital stock, and placing the expenditure of

this sum in the hands of the Canal Commissioners. The canal was completed in 1833, having altogether 40 wooden locks, the minimum size being 110 feet long, by 22 feet wide, with 8 feet depth of water.

In November, 1836, the directors of the Welland Company petitioned the Legislature to make the Canal a public work. A special committee investigated and recommended that the Canal should be taken over by the Government, and that the Receiver General have authority to issue debentures to the stockholders for their stock. This recommendation was voted down by a majority of four. Undeterred by their defeat, they submitted a second report on the 17th December. It came up for discussion in the House on the 11th January, 1837, and as a result certain resolutions were adopted. An Act was passed embodying these resolutions, but the Government still did not undertake to assume the project as a public work. It did, however, turn into stock the £ 102,000 previously advanced on loan and subscribed for £ 245,000 new stock.

In April, 1839, a resolution was carried by a majority vote of seventeen that the private stock of the company should be purchased by the Province, so that the Canal would become wholly a public work. This purchase, however, was not completed until after the Union in 1840.

Since that time the Canal has been owned and operated by the government of Canada. It has been subject to enlargement periodically to meet the increased demands of lake commerce. Even in 1839 Lieutenant Colonel Phillpotts strongly recommended in his report¹ that the wooden locks, then badly in need of repairs, be replaced by locks built of stone and at the same time constructed in the size as those of the Cornwall Canal which had dimensions of 200 feet long by 50 feet wide, with 9 feet of water over the mitre sills. He further recommended that the water necessary to operate the canal should be drawn from Lake Erie instead of being taken by feeder from the Grand River which, at various times, had proved an insufficient source of supply. Improvements in accordance with his recommendations were begun in the year 1842, but the locks then constructed were considerably smaller than the suggested size; their dimensions were only 150 feet long by 26½ feet wide, with a depth of 9 feet of water on the sills. Work was also commenced in 1842 on the enlarged line by way of the Grand River feeder to Port Maitland and by 1845 the enlargement had been completed from Port Dalhousie to

1. Vid. p. 90 supra.

the entrance of the feeder, and the feeder itself had also been made larger as far as Dunnville. This improvement together with the construction of the Port Maitland branch made it possible for vessels to arrive at Lake Erie by a new and shorter route. The summit reach of the canal was also lowered about eight feet to the level of Lake Erie so that a supply of water could be obtained from that source.¹ Other work was also being conducted to make the canal a better navigation facility.²

1. Cf. General Report of Minister of Public Works, (Canada), 1869, pp. 8-9.

"The Welland Canal was assumed by the Government of the Province of Upper Canada, by authority of an Act of Parliament of 1839, and passed into the hands of the Government of the United Provinces of Upper and Lower Canada in 1841. At this period it received its supply of water from the Grand River, but it soon became apparent that the water obtained from this source was insufficient, and in 1843 it was decided that the summit reach of the canal should be lowered to the level of Lake Erie. The works were accordingly commenced in 1846, and are now in so advanced a condition that the Engineers contemplate the achievement of the task of bringing the Lake Erie water into the canal during the summer of 1870."

2. Cf. Ibid., p. 26. (Appendix No. 6. Letter from S. D. Woodruff, Supt. of Welland Canal, 24th July, 1869.)

"Since the 1st of July, 1869, authority has been received for proceeding with the following works, viz.:

"To have 'certain works done on, and shoals removed from, the summit level of the Welland Canal, so that the water can be lowered to that of Lake Erie. The amount at present authorized is \$30,000;' and the rebuilding of the superstructure of the east pier at Port Dalhousie, authorizing for the execution of this work the sum of \$21,000, its estimated cost."

The Canal Commission, reporting on 24th February, 1871, made the following recommendations:¹

"The raising of the lock walls, waste weirs, and banks of the Welland Canal on the present line from Allanburgh to Port Dalhousie, in a permanent manner, to admit the passage of vessels drawing twelve feet of water.

"The enlargement of the Welland Canal on the scale adopted for that work."

The lock dimensions adopted throughout the St. Lawrence route required locks 270 feet long and 45 feet wide, having 12 feet depth of water over the mitre sills.

In accordance with the Commission's recommendations it was decided by the Government to undertake extensive alterations on this canal; the route of the canal was followed from Port Colborne to Allanburg and the locks on this portion enlarged to conform with the scale recommended, but from Allanburg to Port Dalhousie, situated on the south shore of Lake Ontario, a distance of eleven and two-third miles, it was considered best to discard the old canal route and construct an entirely new waterway in an altogether different direction.

Twenty-five masonry lift locks were provided, having uniform dimensions of 370 feet length, 45 feet width,

Cf. General Report of the Minister of Public Works for the Fiscal Year ending 30th June, 1871, pp. 3-4. Vid. also pp. 92-94 supra, note 1.

with a 12-foot depth of water over the sills, but in 1875 it was decided by the Government, after strong representations from commercial interests, to make all permanent structures not then under contract adaptable to a 14-foot navigation; and it was not until 1887 that this depth was available throughout the whole canal. Even before this enlargement was anywhere near its final completion, vessels too large to pass through the locks were in commission on the upper lakes. As the country had outgrown, in its volume of available commerce and shipping, the original canal, so in the evolution of time it outgrew the capacity of the second canal. In 1912, after much agitation and persistent representations to the Government on the part of lake shippers and business men generally, it was decided that a third canal of sufficient capacity to accommodate the largest vessels likely to be built for service on the Great Lakes, be constructed, at an estimated cost of \$50,000,000. The plan at that time contemplated the use of the then present canal channel after widening, deepening, and straightening, from Port Colborne on Lake Erie to Thorold, from which point a new canal cutting about seven miles long was to be made to Lake Ontario at a point three miles east

of Port Dalhousie. Seven locks were to be provided in the stretch between Thorold and Lake Ontario, each being 800 feet long by 80 feet wide, with 30 feet of water over the sills, and having an individual lift of $46\frac{1}{2}$ feet. As finally located, the new Welland Ship Canal follows the course of the former canal from Port Colborne to Allanburg, half-way across the peninsula, thence by an entirely new cutting, across the former canal a short distance below Lock No. 25, and again below Lock No. 11, at which point the surface elevations of the two canals is 382 feet above sea level. From this point the new cutting takes a direct route to the mouth of Ten Mile Creek on Lake Ontario, about three miles east of Port Dalhousie.

The total length of the canal across the peninsula from Lake Erie to Lake Ontario is about 25 miles, and the difference in level of the two lakes approximating 326.3 feet is now overcome by seven lift locks, each having a lift of $46\frac{1}{2}$ feet, and a guard lock of variable lift. These locks are each 829 feet long, 80 feet wide in the clear, with a depth of 30 feet of water over the mitre sills. The width of the canal prism is 200 feet at the bottom, and the depth is 25 feet. A new breakwater, now practically finished, at Port Colborne, extends

2,000 feet further into the lake and at right angles to the existing breakwater. Extensive harbour works have also been practically completed at Port Weller.

Whereas the original estimate called for an outlay of \$50,000,000, up to the 31st March, 1929, an amount of \$103,513,215.58 had been expended on the new canal.

Comparison with dimensions of other important ship canals throughout the world discloses that the Welland Ship Canal has a greater width than any, with exception of the Panama.

Lock No. 8, 1,380 feet long between the inner gates, and the longest one in the world, was put into service on September 16, 1929. "Captain J. J. Manley, of St. Catharines, Ontario, a veteran Great Lakes Master, was deputed to pull the switches opening the lower gates, thus allowing four ships, which were already in the lock, to pass down, the leading ship, the S.S Meaford of the Canada Steamship Lines, breaking the silk ribbon strung across the lock."¹

"On December 7, 1928, the Welland Canal channel, between the present aqueduct at Welland and the crossing

1. Report of the Engineer in charge of construction of the Welland Ship Canal, dated October 1, 1929.



Port Weller harbor of Welland Ship Canal and entrance to Lock No. 1



One of the several bridges that span the new Welland Ship Canal

Courtesy The Canadian Club of New York

of the old and new canal routes about one mile north of this point, was abandoned and traffic diverted to the new route over the siphon culvert."¹

The Sault Ste. Marie Canal

This canal furnished water communication between Lake Huron and Lake Superior by surmounting with a single lock the insuperable rapids of St. Mary's River which, in the course of less than a mile, drops about 20 feet. The Canal is built through the St. Mary's Island on the north side of the river, and lies wholly within Canadian territory; its length is 1.41 statute miles.

The rapids of the St. Mary's River insuperably impeded free navigation for the canoes and bateaux of the Indians and early voyagers who, because of this natural barrier, were obliged to make costly portages of increasing cargoes of furs and merchandise around the falls. Towards the close of the 18th century the North-West Company, in its effort to gain an advantage over its competitor, the Hudson's Bay Company, built a canal with a single lock on the Canadian side of the St. Mary's River. The survey for this canal was made by the Company

1. Cf. Annual Report of the Department of Railways and Canals for the Fiscal Year from April 1, 1928, to March 31, 1929. (Report of Chief Engineer), p. 96.

in 1797, and the canal as built by this group of associates was 2,580 feet in length, with one lock 38 feet 9 inches wide and depth of water of 9 feet.¹

This canal was in use by canoes and bateaux until 1814 when the United States troops destroyed all but the timber floor and sills.

The North-West Company did not rebuild the canal, and no attempts² were made to construct one at this remote place until the year 1851 in which year two petitions³ were presented seeking permission to construct another canal on the Canadian side. One petition was made in behalf of Angus D. McDonell of Toronto, and the other by Frederick Chase Capreol. The petition of the former was presented in the Legislature and efforts made to pass a bill for the incorporation of the Sault Ste. Marie Canal Company; the bill had its third reading on 22nd July, 1851, and was rejected. Capreol also

1. Vid. p. 112 supra.

2. "In 1843 one old gray horse and a wagon," says Mr. Charles Vining (The St. Lawrence Waterway" - four articles reprinted from "The Toronto Star Weekly" of March 31, April 7, 14, and 21, 1928), "did all the transshipment around St. Mary's Falls, but as the west developed the traffic grew and in 1844 the first shallow canal was started." "Now there is a twenty-foot canal," he says, "connecting the two lakes and the traffic far exceeds that of either the Suez or Panama Canals."

3. Vid. p. 125 supra.

was unable to obtain a charter. In the following year Mr. Allen McDonell of Toronto petitioned the Legislature for a charter, but by this time the State of Michigan had commenced the construction of a canal within the United States borders, and the Legislature evidently deemed it inadvisable to duplicate the efforts on the Canadian side at that time.

In the year 1871 the Minister of Public Works for Canada, in his report for the year ending 30th June, made the following statement:¹

"To give effect to the Canal Commissioners' recommendations respecting the proposed canal on the Canadian side of the Sault Ste. Marie, the Chief Engineer of Public Works has been instructed to make any further surveys and examinations that may be necessary and to report on the subject an early date."

Sixteen years later (1887) a survey of the ground was made by the Canadian Government, and in the following two years contracts were awarded for the construction of a canal on St. Mary's Island. The initial plan contemplated a single lock 600 feet long by 85 feet wide, with $16\frac{1}{2}$ feet depth of water on the mitre sills at the lowest recorded water level. The prospect of a tremendously increased volume of traffic in wheat urged ship owners to make representations to the

1. Cf. Report of the Minister of Public Works, for the fiscal year ending 30th June, 1871, p. 11.

Dominion Government that the length of the lock be increased. As a consequence of their organized movement the plans were altered to provide for great dimensions so that the lock was built 900 feet long, 60 feet wide, with about 20 feet of water on the sills at the minimum level. This size permits several vessels to pass through the canal at one time.

On September 10, 1895, the canal was opened for navigation and was immediately used by a large number of vessels, the volume of traffic increasing steadily until in 1928 it was recorded that 3,358 vessels used the canal, with a registered tonnage of 4,584,066 tons.

Growth in Size of Locks; 1866 - 1930.

A comparative study of Table V and Table VI on the following pages reveals the fact that the minimum size of the locks on the through-St. Lawrence route was substantially increased from 150 feet by $26\frac{1}{2}$ feet to 270 feet by 45 feet during the period intervening between the years 1866 and 1930. The minimum depth of water over the mitre sills also had been increased in the same period from 9 to 14 feet, which is today the minimum depth available for navigation between Lake Superior and the seaboard at Montreal via the St. Lawrence waterway. Efforts are on foot at the present

TABLE V

* Table showing the size of the smallest locks on the Canals of the St. Lawrence line of navigation, also the dimensions of the largest vessel which may pass through them.

Name of Canal	Dimensions of Locks in feet.		Depth of Water on Sill.	Dimension of Vessel in feet.			Tonnage of Vessel
	Length	Breadth		Length	Breadth	Draught of Water when loaded	
St. Lawrence Canals	200	45	9	186	$44\frac{3}{4}$	9	600
Welland Canal	150	$26\frac{1}{2}$	$10\frac{1}{4}$	$42\frac{1}{2}$	$26\frac{1}{4}$	10	400
Sault Ste. Marie Canal	(350	(70 top (61 bottom	12	....	....	....	2000

* Table taken from the General Report of the Minister of Public Works (Canadian Government) for the year ending 30th June, 1866. p. 14.

TABLE VI

C A N A L S O F C A N A D A

NAME	LOCATION	Length Miles	LOCKS			
			No.	Length Feet	Width Feet	Depth Feet
Lachine	Montreal to Lachine	8.50	5	270	45	14
Soulanges	Cascades Point to Coteau Landing	14.00	5	280	45	15
Cornwall	Cornwall to Dickinson's Landing	11.00	6	270	45	14
Farran's Point	Farran's Point Rapid	1.25	1	800	50	14
Rapide Plat	Rapide Plat, Morrisburg	3.67	2	270	45	14
Galops	Iroquois to Cardinal	7.33	3	270	45	14
Murray	Isthmus of Murray, Bay of Quinte	5.17	None			12
Welland	Port Dalhousie, Lake Ontario to Port Colborne, Lake Erie	26.75	26	270	44	14
Sault Ste. Marie	St. Mary's Rapids, 47 Mls. W. of L. Huron	1.41	1	900	60	19.5
Ste. Anne Lock	Junction of St. Lawrence and Ottawa Rivers	0.12	1	200	45	9
Carillon	Carillon Rapids, Ottawa River	0.75	2	200	45	9
Grenville	Long Sault Rapids, Ottawa River	5.75	5	200	45	9
Rideau	Ottawa to Kingston, Ont.	126.25	47	134	33	5
	Rideau Lake to Perth (Tay Branch)	7.00	2	134	33	5
St. Ours Lock	St. Ours, Que., Richelieu River	0.12	1	200	45	7
Chambly	Chambly to St. John's, Que.	12.00	9	118	22.5	7
Trent	Trenton to Peterboro Lock, Peterboro, Ont.	89.00	18	175	33	8.3
	Peterboro to head of Lake Couchiching, Ont.	114.60	23	134	33	6
	Sturgeon Lake to Port Perry (Scugog Branch)	30.00	1	142	33	6
	Port Severn Lock		1	100	25	6
St. Peter's	St. Peter's Bay to Bras d'Or Lakes, Cape Breton, N.S.	0.49	1	300	48	18

TABLE VII

C H R O N O L O G Y

THE SAINT LAWRENCE RIVER CANAL SYSTEM

Name	Begun	Finished	
Lachine Canal	July, 1821	Opened	August, 1824
First vessel passed			1825
New Locks	1843	"	1848
Enlarged	1871	Completed	1875
Canal widened	1843	"	1862
Present Canal	1875	Opened	1901
Beauharnois Canal	June, 1842	"	August, 1845
Displaced by Soulanges		Abandoned	1899
Leased to Can.Lt.&Pow.Co			1907
Soulanges Canal	1891	Completed	1899
Cornwall Canal	1834	Opened	April, 1843
Enlarged	1887	Completed	1900
Williamsburg:			
Farran's Point	1844	Opened	June, 1847
Enlarged	1887	Completed	1903
Rapide Plat	1844	Opened	Sept., 1847
Enlarged	1887	Completed	1903
Galops:			
Iroquois	1844	Opened	Oct., 1847
Junction	1849	"	1857
Galops	1844	"	Nov., 1846
Enlarged	1887	Completed	1903
Welland Canal	Nov., 1824	Opened	Nov., 1829
First enlargement	1841	Completed	1850
Second "	1873	"	1887
Welland Ship Canal	Aug., 1913	"	(?) 1930
Sault Ste. Marie Canal	1887	Opened	Sept., 1895

time to deepen the canals and connecting channells on the entire route to a minimum depth of 25 feet. The new Beauharnois canal, a lateral cut about 14 miles long from Hungry Bay on Lake St. Francis to Melocheville on Lake St. Louis, is to be 27 feet deep with provision for a 30-foot depth over permanent lock foundations. It will have two lift locks at Melocheville overcoming a lockage rise of 83 feet.

Chronology of St. Lawrence Canals

A chronology,¹ showing the beginning and the completion of each particular undertaking by the industrious people of Canada in their untiring efforts to overcome the obstacles with which Nature so unkindly obstructed an otherwise navigable waterway to the sea, is given in Table VII on the preceding page. The data is gathered from various sources as indicated in the footnotes of the preceding pages.

1. Vid. also Chronology of Early Canals shown on page 127 above.

CHAPTER V

DEVELOPMENT OF UNITED STATES CANALS CONNECTING INTERNATIONAL BOUNDARY WATERS

History of Early Canal Building

In the early days, when pioneer settlers were moving westward from the Atlantic coast, the chief route of travel lay along the inland waterways. Pioneers moved their heavy goods on rafts and shallow draft boats. Gradually turnpikes were opened, and although they helped materially, they did not solve the transportation problem, for the cost of moving goods was still excessive. Attention was, therefore, drawn more and more towards the construction of artificial channels of water communication as a possible solution. In the European countries many artificial waterways were in use and it was agitated that the same method of navigation could be made possible in America.

The first artificial water communication system, having any resemblance to a canal, to be constructed in America was the short stretch of waterway built in 1750 in Orange County, New York State, by Lieutenant

Governor Cadwallader Colden for the transportation of stone from a quarry.

Governor Sir Henry Moore of New York, in his message on December 16, 1768, to the Colonial Assembly, stated that "the obstruction of navigation in the Mohawk river between Schenectady and Fort Stanwix, occasioned by the falls of Canajoharie, had been constantly complained of and that it was obvious to all who were conversant in matters of this kind that the difficulty could be easily removed by sluices by the plan of those in the great canal of Languedoc, France, which was made to open a communication between the Atlantic Ocean and the Mediterranean."¹ Mr. Hill writes that "this is the earliest authentic proposal for the construction of artificial water communication to overcome the falls in the Mohawk between Schenectady and Fort Stanwix of which we have any record."²

General Philip Schuyler, who, after his return in 1761 from England³ where he had observed the manner in which that country was constructing canals, had urged Governor Moore to investigate the possibility of making the Mohawk navigable by such artificial means, and made

1. Henry W. Hill, "Waterways and Canal Construction," in Buffalo Historical Society Publication, 1908, Vol. 12, p. 39.

2. Hill, op. cit., loc. cit.

3. Ibid., p. 37

a proposal, in the year 1776, for a waterway system between Lake Champlain and the river Hudson. He was given authority to "take measures for clearing Wood Creek at Skeensboro, constructing there and taking the level of the waters falling into the Hudson at Fort Edward and into Wood Creek."¹

While engaged in a conversation with General Philip Schuyler and Morgan Lewis at Fort Edward, in 1777, Gouverneur Morris said: "At a no very distant day the waters of the great western seas will by the aid of man break through the barriers and mingle with those of the Hudson. Numerous streams pass these barriers through natural channels and artificial ones may be conducted by the same routes."²

General George Washington, in the year 1774, succeeded in having a law³ passed by the Legislature of Virginia "empowering such individuals as were disposed to embark in the enterprise to open the Potomac" and render it navigable as far as Will's Creek, a distance of nearly one hundred miles. In a letter to Mr.

1. Hill, op. cit., p. 40.

2. Ibid., loc. cit.

3. Cf. Thomas C. Purdy, "Report on the Canals of the United States" in the United States Census, 1883, Vol. 4, pp. 15-16.

Jefferson in the month of March, 1784, he comments upon his scheme in the following language:

"To get this business in motion I was obliged, even on that ground, to comprehend James river, in order to remove the jealousies which arose from the attempt to extend the navigation of the Potomac.

"The scheme, however, was in a tolerably good train when I set out for Cambridge in 1775, and would have been in an excellent way had it not been for the difficulties which were met with in the Maryland assembly from the opposition, which was given (according to report) by the Baltimore merchants, who were alarmed - and perhaps not without cause - at the consequence of water transportation to Georgetown of the produce which usually comes to their market by land."

Late that year commissioners were appointed by the Legislatures of Maryland and Virginia, with Washington as a member from the latter state. On December 22, 1784, they held a meeting at Annapolis, which meeting they described in the minutes as a conference "upon the subject of opening and improving the navigation of the river Potomac and concerting a plan for opening a proper road between the waters of the Potomac and the most convenient western waters." As a result of this conference, both State Legislatures enacted bills authorizing the group to form the "Potomac Company" with a capital stock of 500 shares of £ 100 Sterling each. The company was organized on May 17, 1785, with Mr. George Washington as its first President. The company undertook the construction of a canal, which, up to 1825, had not been

a profitable venture. On May 16, 1825, the stockholders agreed to surrender their charter to the "Chesapeake and Ohio Company."

On the 5th of January, 1785, the Legislature of Virginia passed an Act for the clearing and improvement of navigation of the James River, and for the incorporation of the original James River Company. This company constructed a canal to surmount the navigation barrier set up by the falls in the James River, extending from Richmond to Westham, a distance of seven miles. The canal was 25 feet wide, 3 feet deep, with 15 locks overcoming a total ascent of 114 feet as far as Westham.

"The second James River Company, on state account, enlarged and reconstructed the former canal from Richmond to Westham, and extended the same to Maiden's Adventure, in Goochland County, a distance of 27 miles. This company also constructed a canal through Blue Ridge, $7\frac{1}{2}$ miles long, and a turnpike road from Covington to the mouth of Big Sandy River, 280 miles long, and improved the Kanawha River by wing-dams and sluices from Charleston to its mouth, a distance of 58 miles."¹

1. Cf. Thomas C. Purdy, "Report on the Canals of the United States" in the United States Census, 1883, Vol. 4, p. 30.

In the year 1787 the Legislatures of Virginia and North Carolina jointly chartered a company to build the Dismal Swamp canal. It was begun in 1787 and opened in 1794. It ran from Deep Creek to Joyce's Creek, at the head of Pasquotank River, and connected with the waters of the Chesapeake and Albemarle Sound. The canal was $22\frac{1}{2}$ miles long, 40 feet wide, and $6\frac{1}{2}$ feet deep. It was enlarged and opened on the 31st of December, 1828; the schooner "Rebecca Edwards," with a cargo of cotton, pork, and flour, was the first vessel to pass through.¹

In 1791 a committee on navigation submitted a report² to the Legislature of the State of Pennsylvania, recommending the improvement of the Delaware, Lackawanna and Lehigh rivers; a canal from the river Schuylkill to the river Susquehanna by way of the Tulpehocken and Swatara; the improvement of the river Susquehanna with its north and west branches, and a navigable water communication by way of the Sinnamahoning between the west branch of the river Susquehanna and the river Alleghany and Lake Erie. No action was taken by the State, however, until the Erie canal was nearly completed when

1. Cf. Purdy, op. cit., p. 20

2. Ibid., p. 6.

in 1824 an Act was passed authorizing the appointment of commissioners and the exploration and survey of canal routes from the town of Harrisburg to Pittsburgh and westward.

Two separate companies¹ were formed for the purpose of uniting the Schuylkill and Susquehanna by means of a canal. One was organized on September 29, 1791, under the name² of the "Schuylkill and Susquehanna Navigation Company," and the other was organized on April 10, 1792, and designated³ the "Delaware and Schuylkill Canal and Navigation Company." It was later learned that their efforts and interests were identical and to

1. Cf. Purdy, op. cit., p. 13. Cf. also Encyclopaedia Americana, 1836, Vol. VII, p. 20.

2. "An Act to enable the Governor of this commonwealth (Pennsylvania) to incorporate a company for opening a canal and lock-navigation between the rivers Schuylkill and Susquehanna, by the waters of Tulpehocken, Quittapahilla and Swatara, in the counties of Berks and Dauphin." The Company, by section II of Act was named "The President, Managers and Company of the Schuylkill and Susquehanna navigation." The Act was approved on September 29, 1791, by Mr. Thomas Mifflin, Governor of Pennsylvania.

3. "An Act to enable the Governor of this commonwealth (Pennsylvania) to incorporate a company, for opening a canal and water communication between the rivers Delaware and Schuylkill, and for other purposes therein mentioned." By section I, David Rittenhouse, William Moore Smith, Elliston Perot, Cadwallader Evans, Jr., and Francis Johnston were appointed Commissioners, to take subscriptions for establishing a canal between Schuylkill and Delaware. The act was approved by Governor Thomas Mifflin on April 10, 1792.

obtain greater cooperation of activities toward the one goal, both companies were consolidated by an Act of the Legislature of Pennsylvania into a new company, the "Union Canal Company," incorporated on April 2, 1811. Construction of a canal was shortly thereafter begun, but activities were suspended with the advent of the War of 1812. Work was not resumed until the year 1821, and the main canal completed in December, 1827. The canal was 82 miles long, exclusive of open navigation of $7\frac{1}{2}$ miles, 36 feet wide at the water surface, 24 feet wide at the bottom, with 4 feet depth of water. It was provided with 83 locks with varying lifts of from 4 to 8 feet; total lockage, 520 feet.

The Legislature of New York State passed an Act¹ on March 24, 1792, intituled, "An Act for Establishing and Opening Lock Navigation within the State." This Act became Chapter 40 of the Laws of 1792; it authorized the incorporation of the "Western Inland Lock Navigation Company" and the "Northern Inland Lock Navigation Company." The former was organized for the purpose "of opening a lock navigation from the now navigable

1. Cf. Buffalo Historical Society, 1918. Vol. XXII, pp. 50, 51 and 206.

part of Hudson's River to be extended to Lake Ontario" and "from the Three River Point up Seneca River to the lakes of Western New York." The latter company was organized for the purpose of building a canal from the now navigable part of the Hudson's River northward to Lake Champlain. These canals were to be of sufficient size so as to permit the passage of boats 45 feet long, 20 feet wide, and with a maximum draft of 2 feet. By the year 1797 the Western Inland Lock Navigation Company had constructed six miles of canals around rapids on the Mohawk River, making a navigable passage for boats from above Little Falls to Lake Ontario. Some years later the State of New York bought out the companies and undertook building operations.

One of the first canals¹ in America was that built in 1793 around the rapids in the Connecticut River at South Hadley Falls, Massachusetts, by a company which was chartered in 1792. Benjamin Prescott of Northampton, subsequently the superintendent of the Governmental Armory at Springfield, was the engineer having charge of the construction operations. Although lift locks had

1. Universal Cyclopaedia and Atlas, 1908, Vol. II, p. 321. Cf. also The Encyclopaedia Americana, 1928, Vol. V, p. 485.

been invented as early as 1481 by two engineers of Viterbo, Italy, such a system of lockage was not built in this canal; rather, inclined planes were installed by which method boats were carried up and down the plane in a movable car or caisson filled with water, and hauled up by cables operated by power transmitted from water-wheels. Later, however, the canal was lowered about four feet, and the carrying car, cables, and water-wheels for the purpose were discarded. In their stead and under the direction of Ariel Cobley, a person of great energy and ingenuity, was introduced the ordinary canal-lock. Funds to carry out the construction of this earliest work of internal improvement were in part obtained from European countries, particularly Holland; "and this first placing of funds in canal-stocks in the United States returned as little interest as many subsequent larger operations."¹

Between the years 1793 and 1796, Captain Elisha Mack built a canal, having a length of three miles, around Turner's Falls on the Connecticut River. It was

1. Universal Cyclopaedia and Atlas, 1908, Vol. II, p. 321. "It is interesting to note that from 1791 to 1794 speculation in canal shares became a mania in England and finally resulted in a financial crash and the ruin of many persons." Cf. also The New International Encyclopaedia, 2nd Edition, Vol. 4, p. 447.

later abandoned as a means of artificial navigation, and was only used thereafter to furnish water-power.¹

A company,² called "The Proprietors of the Locks and Canals on the Merrimack River," was incorporated in the year 1792; its charter was dated June 25, 1792. This company proposed to open water communication with Newburyport, and had scarcely begun its construction operations when other interested men associated and conceived the idea of constructing a canal which would open a navigable passage with the Charles River and Boston harbour. However, the first-mentioned company opened their canal around the Pawtucket Falls, leading into the Concord River, and thence into the Merrimack River at Chelmsford (Lowell) in 1797. It was one and a half miles long, had four locks, and cost about \$50,000; it was chiefly used for transporting lumber, rafts, masts, and similar articles.

The first canal for the transportation of both passengers and merchandise to be built in America was the Middlesex Canal,³ which, it is generally presumed,

1. Cf. The Universal Cyclopaedia, 1900, Vol. II, p. 321. (New York: D. Appleton & Co.)

2. Ibid., loc. cit. Also the Encyclopaedia Americana, 1836, Vol. VII, p. 18. (Philadelphia: Desilver, Thomas & Co.)

3. Cf. Encyclopaedia Americana, 1836, Vol. VII, p. 17. And also Cf. Purdy, op. cit., pp. 26-27.

superceded the Merrimack Company's canal. The Middlesex Canal Company was granted a charter of incorporation June 22, 1793, and work was immediately begun about one mile above the Pawtucket Falls, to open a water communication between the Merrimack River and Boston harbour, a distance of twenty-seven miles. The canal was 30 feet wide at the water surface, 20 feet wide at the bottom, with 3 feet depth of water. There were twenty locks of varying lifts, the maximum being 12 feet. Each lock was 75 feet long, 10 feet wide at the bottom, and 11 feet at the top. The canal was completed and opened as far as Woburn in 1804, but did not open communication with Charlestown until 1808. The water for navigation was obtained from the Concord River at Billerica. A packet boat, the "Governor Sullivan," made regular trips between Lowell and Boston, taking almost a day to do the journey. In 1814 the first boat voyage was made to Concord, and by 1819 regular steamer service had been established. The business of the company continually increased up to 1835, in which year the building of the Boston and Lowell Railroad was undertaken; after that a gradual decline set in, and on June 1, 1853, business was suspended. Six years later the rights of the company, obtained by virtue of the

charter, were forfeited, and the title to the land reverted to the "original proprietors."

About 1794 Governor Carondelet constructed the Carondelet Canal¹ connecting New Orleans and Bayou Saint John at a cost of \$750,000. It was two miles in length, 60 feet wide at the water surface, with a depth of 7 feet of water. The residents of Louisiana contributed a large force of slaves to aid in its construction.

One of the chief artificial waterways in the South was the Santee and Cooper's River Canal,² extending for twenty-two miles between the Santee River in South Carolina to the head of Cooper's River, thence on to Charleston harbour. From Santee River to the summit level the ground rose 38 feet, which was overcome by four locks. From the summit level to Cooper's River the descent of 68 feet was overcome by nine locks. The locks were 60 feet in length and 10 feet wide. The canal was 32 feet wide at the top, and 20 feet at the bottom, with a depth of 4 feet of water. It was completed in the year 1802 at an expenditure of \$650,667.

In the year 1800 the Legislature of New Jersey³ granted a perpetual charter to a stock company, which

1. Cf. Purdy, op. cit., p. 21.

2. Cf. Encyclopaedia Americana, 1836, Vol. 7, p. 23.

3. Cf. Purdy, op. cit., p. 6.

was designated as the "Penn's Neck Canal Company." It was given power to cut a tide-water canal connecting the waters of the river Delaware with the headwaters of Salem Creek, a distance of 2 miles and 8 rods. A new charter was procured in 1868, and the name was changed to "The Salem Creek Consolidated Meadow Company;" the company was organized on November 13, 1869.

Many artificial waterway projects were engendered with the advent of the nineteenth century, and during the second decade an immense impetus was given to the cause of internal improvements by the commencement of work upon the Erie Canal.

New York State Barge Canal

From the time of the earliest settlement of New York the possibility of connecting the Hudson River with the Great Lakes by an artificial waterway has occupied the attention of the citizens of that state. The great era of canal building in England, stimulated by the opening of the Bridgewater Canal, caused considerable interest in that type of transportation in this country. Such a project was drawn to the attention of the New York Colonial Assembly by Governor Sir Henry Moore of New York, as early as December 16, 1768, when he proposed the construction of a canal around Little

Falls on a plan similar to that of the "grand canal of Languedoc in France" so as to establish water communication between the Hudson River and Lake Ontario.¹ It was kept before the Assembly for deliberation continually from that time on, but no definite action was taken on account of the disturbed conditions preceding the Revolutionary War and the conflict itself, although it is recorded that during the War General George Washington himself examined, among others, this particular route. After the War efforts were resumed in an endeavor to bring about the accomplishment of this project.

On Monday, February 23, 1791, the committee of the whole house presented a resolution to the Legislature of New York State petitioning for improvement of inland navigation. The Legislature on March 24, 1791, passed an act intituled, "An Act concerning roads and inland navigation," which authorized a survey of part of the Mohawk River. The language of the act is as follows:-

"And be it further enacted that the Commissioners of the land authorities be, and they are hereby authorized to cause to be explored and the necessary survey made of the ground situated between Mohawk River and at or near Fort Stanwix to Wood Creek in the County of Washington, and to cause an estimate to be made of the probable expense that will attend the making of canals sufficient for loaded boats."²

1. Vid., p. 237 supra.

2. Buffalo Historical Society, 1908, Vol. XII, p. 49.

An appropriation of \$250 was made to defray the expenses of the commissioners. Major Abraham Hardenburgh, assisted by Benjamin Wright, made a survey in the latter part of 1791 and laid out a junction canal between Wood Creek and the Mohawk River. This route was afterwards followed by the Western Inland Lock Navigation Company.

On the 13th day of March, 1792, the Legislature of New York passed an act intituled, "An Act for establishing and opening lock navigation within this state."¹ This act authorized the incorporation of the Western Inland Lock Navigation Company, with a capital of \$25,000, divided into 1,000 shares of \$25 each, of which no stockholder would be allowed to hold more than 10 shares. This company was incorporated for the purpose of opening lock navigation between the Hudson River and Lake Ontario, and from the Three River Point up the Seneca River to the lakes in the western part of New York State, for boats having a beam of 20 feet and a draft of 2 feet. Under the same act the Northern Inland Lock Navigation Company was also incorporated

1. Cf. Archer Butler Hulbert, "The Great American Canals," (The Erie Canal.) Vol. II, p. 22. (Cleveland: Arthur H. Clark Co., 1904). Also cf. "Laws of the State of New York, (New York, 1792) Vol. 2, Chapter XL.

to open lock navigation between the Hudson River and Lake Champlain.

Work was begun by the former company in April, 1793, on the digging of a canal around Little Falls in the Mohawk River, and by November of 1795 it was opened for boat navigation. This small canal was 4,752 feet long, and was equipped with 5 locks having a total lockage lift of 44 feet 7 inches.¹ By the year 1797 the company had completed 6 miles of canals around the rapids on the Mohawk River, making a passage for 15-ton boats from above Little Falls to Lake Ontario. Some years later the State of New York bought out the entire system.

On February 4, 1808, Mr. Joshua Forman, a member of the New York Legislature, introduced a bill² praying "that a joint committee be appointed to take into consideration the propriety of exploring and causing an accurate survey to be made of the most eligible and direct route for a canal to open a communication between the tidewaters of the Hudson River and lake Erie; to the end that Congress may be enabled to appropriate such sums as may be necessary to the accomplishment of that great national object." The Assembly

1. Hulbert, op. cit., pp. 35-36.

2. Ibid., pp. 49 et seq.

appointed a committee to investigate the subject, and if found practicable, to solicit the cooperation of the General Government in its accomplishment. A sum of \$600 was set aside for a survey of the proposed canal, and Simeon DeWitt, the surveyor general of New York, was directed to survey a route from the Hudson River to Lake Erie. He in turn appointed the first engineer, James Geddes, who made his report on January 20, 1809, on canal routes from Oneida Lake to Oswego.

In 1810, General Platt, a member of the New York Senate, submitted to DeWitt Clinton a draft of a resolution which was favorably received and introduced by him in the Senate, where it passed on March 13 of that same year. As a consequence of this resolution the Legislature appointed a commission of seven members, at the head of which was Gouverneur Morris, to whom is attributed the first suggestion of the Erie Canal, in 1803. The commissioners were Gouverneur Morris, Stephen Van Rensselaer, DeWitt Clinton, Simeon DeWitt, William North, Thomas Eddy, and Peter B. Porter, to which group was added, in 1811, Robert R. Livingston and Robert Fulton.¹

On March 2, 1811, the commissioners made a full

1. Buffalo Historical Society, 1918, Vol. XXII, p. 285. Cf. also Hulbert, op. cit., pp. 52 and 56.

report after the personal inspection of all available routes, they having the assistance of competent engineers. The commissioners favored the route direct from "the Hudson by way of the Mohawk, Wood Creek, Oneida Lake, Seneca River, and thence overland to Lake Erie."

The War of 1812 brought about the dissolution of the board of canal commissioners, and further action was held in abeyance until April 17, 1816, when a board of commissioners was again appointed with powers similar to those exercised by the board of 1810. The members of this new board were: DeWitt Clinton, Stephen Van Rensselaer, Townsend M'Coun, Melancton Wheeler, Henry Seymour, Joseph Ellicott, Jacob Van Rensselaer, Phillip D. Schuyler, Samuel Young, John Nicholas, William Bayard, George Huntington, and Nathan Smith. The board displayed such energy in the performance of its duties that the Legislature of New York was enabled to pass an act on April 15, 1817, intitled, "An Act respecting Navigable Communications between the great western lakes and the Atlantic Ocean."¹

"The Erie Canal," writes Mr. Hulbert, "was born

1. Hulbert, op. cit., p. 219, Appendix B. And also "Laws of the State of New York" relating to canals, Vol. II, pp. 358-364.

in the act of April 15, 1817." The canal was to be 40 feet wide at the water surface and 28 feet wide at the bottom, with a four foot depth of water, and the locks were to be 90 feet long by 12 feet wide. Contracts were immediately entered into; the first one for work on the Erie Canal was signed on June 7, 1817. The work was not begun, however, until a formal inaugural celebration at Rome, New York, was held on July 4, 1817, when the excavation was commenced in the vicinity of that city. The entire route was divided into three sections: the eastern from the Hudson to Utica, the middle section from Utica to the Seneca River, and the western section from Seneca River to Lake Erie. The middle section, including a branch from Oneida Lake to Syracuse, was completed for navigation in October, 1819.

By an act passed in the year 1819 the construction of the main canal was authorized between the Hudson River in the east and Lake Erie in the west. In the years 1819 and 1820, 43 miles of the western section from Seneca River to Lake Erie, chiefly on the east of the Genesee River, and in 1820, 26 miles on the eastern section between the Hudson and Utica, were put under contract. Operations were simultaneously

conducted in both sections. Early in 1821 the balance of the eastern and that part of the western section below the Genesee and Tonawanda Creek were let; in November of the same year boats descended as far east as Little Falls on the Mohawk River.

"By June, 1823," writes Mr. Hulbert, "the canal was open from Rochester to Schenectady, and when the season opened 220 miles were navigable. During 1822 all but 10 miles of the route along the Niagara River had been put under contract, and the great Genesee aqueduct had been erected. By the middle of November water had been admitted into the eastern section and boats were afloat from Little Falls to Schenectady. Water was admitted into the stretch of canal between Brockport and Rochester on October 10, 1823," and boats from the north and west entered the Hudson River at Albany.¹

On October 26, 1825, the first boat, "Seneca Chief," bearing Governor Clinton, the lieutenant governor, and a company of the state's distinguished citizens started from Buffalo en route for New York. The boat also bore two barrels of water from Lake Erie, and on arrival in New York, on November 4, a

1. Hulbert, op. cit., p. 135 et seq.

proper ceremony was performed in which the water from Lake Erie was poured into New York harbor to signify the union of the waters of Lake Erie and the Atlantic Ocean.

A tremendous increase of trade on the Great Lakes and canals made it apparent that the capacity of the Erie Canal was quite inadequate to care for the potential volume of traffic to move upon it. Recognizing this fact the canal commissioners made a special report on January 29, 1834, to the Legislature suggesting the doubling of the locks east of Syracuse, and the rebuilding of the aqueduct at Rochester. As a consequence, an act was passed the same year empowering the canal commissioners to construct a second set of locks of such dimensions as they considered proper on the Erie Canal from Syracuse to Albany, but in 1835 this act was repealed and another act passed on May 11, 1835, for the enlargement of the Erie Canal in its whole extent, and for the reconstruction of the aqueduct with a 40-foot waterway. In July, 1835, the canal commissioners determined "that the canal be enlarged to give 6 foot depth, 60 feet width of water on the surface, and that the locks be 105 feet long and 15 feet wide in the clear."¹ But in October of the

1. Hulbert, op. cit., p. 190 et seq.

same year they voted to enlarge the Erie Canal to a depth of 7 feet, 70 feet wide at the surface, and with locks 110 feet long and 18 feet wide.¹ Work was commenced in August, 1836, but very little was accomplished until the year 1837 when \$636,312 was expended.

In 1839, "contracts to the amount of ten and a half million," says Mr. Hulbert, "for the whole work of enlargement had been signed. The commissioners were authorized by an act passed April 18, 1839, to borrow four millions. The work went on rapidly. By April 1, 1842, the Rochester aqueduct was completed at a cost of half a million. The north pier of the locks at Lockport was in use in April of the following year. The total cost of the works here was \$610,978. In 1845, 29 out of 49 double sets of locks between Albany and Syracuse were completed, and 98 miles of the new enlarged canal were open for use; the cost for this portion was \$3,685,438. The total cost of the enlargements contracted for prior to April 1, 1842, was \$9,361,442. By 1850 the cost had run up to fifteen millions, This enlargement was completed in 1862 and is legally known as

1. Hulbert, op. cit., pp. 191-192.

the 'enlargement of 1862.' When completed, the canal was $350\frac{1}{2}$ miles long; it had 72 locks, measuring 110 by 18 feet, of which 57 were double and 15 single. The building of the double locks did not cease until 1875."¹ The total rise of lockage was reduced from 675.50 to 656.46 feet. The enlarged canal then had a width of 70 feet at the water surface, 55.5 feet at the bottom, with 7 feet depth, accommodating vessels carrying 240 tons of freight.

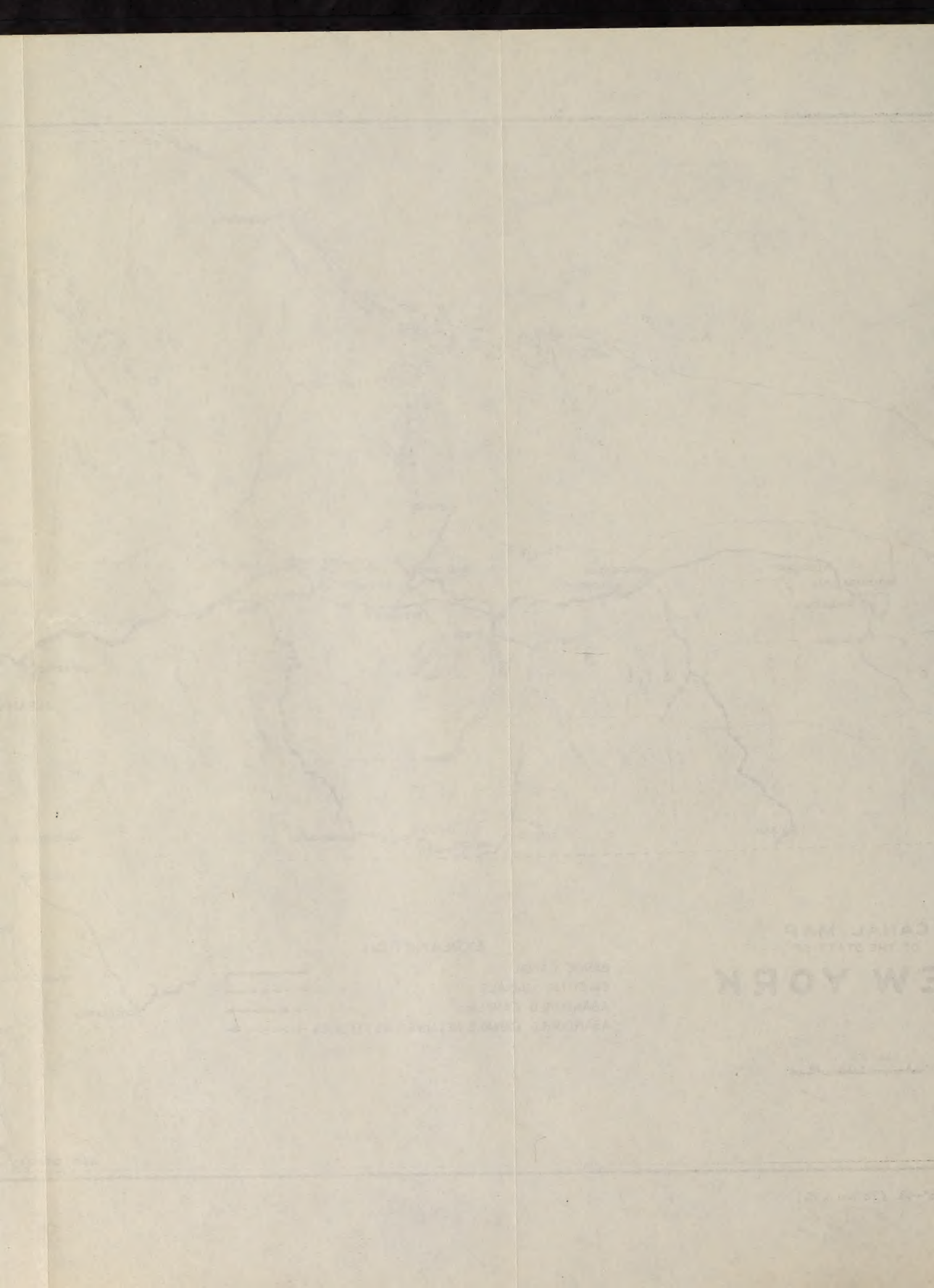
Tolls on canal traffic were abolished with the approval of the voters on November 7, 1882, and the abolition became effective on and after January 1, 1883. Since that time all canal traffic in New York State has moved without toll charges, and all canal improvement and maintenance costs have been borne by the State Treasury from funds provided by tax-payers.

In 1884 an extensive program of canal improvements was undertaken and continued until late in 1891, when a suspension of operations was forced by failure of the Legislature to provide funds. A constitutional amendment authorizing the second enlargement of the Oswego, Champlain, and Erie Canals was submitted to the people in 1894 for their approval, which was given

1. Hulbert, op. cit., pp. 193-194.

The enlargement of 1863. When completed, the canal was 350 feet long; it had 13 locks, measuring 110 by 15 feet, of which 57 were double and 13 single. The building of the double locks did not cease until 1875. The total time of lockage was reduced from 575.50 to 556.45 feet. The enlarged canal then had a width of 70 feet at the water surface, 55.5 feet at the bottom, with 7 feet depth, accommodating vessels carrying 240 tons of freight.

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at the polls. The following year the so-called "Nine Million Dollar Law" was passed and a bond issue was floated. With special reference to the Erie Canal, the act provided for not less than 9 feet of water, except over the aqueduct mitre sills and other permanent structures, where an 8-foot depth was to prevail.

Throughout all these years the history of the construction and operation of the Oswego, Champlain, and Seneca-Cayuga Canals was much the same as that of the Erie Canal.

On April 7, 1903, the New York State Legislature passed an act authorizing a third enlargement of the Erie Canal, as well as improvements on the Oswego and Champlain Canals, and the union of all to form the New York State Barge Canal System. The act provided for a channel 75 feet at the bottom and 122 feet at the surface, with a depth of 12 feet of water. The locks were to be 328 feet in length by 45 feet in width, with a 12-foot depth of water over the sills.

The enlargement of the Seneca-Cayuga Canal was not decided upon until 1909, when a referendum vote approved the adding of this artificial waterway to the then present barge system, at an estimated cost of \$7,000,000.

In the state barge system of canals at the present time all the locks are constructed of concrete, and with the exception of the siphon lock at Oswego, which has a lockage lift of 25 feet, all are operated by electricity.

The system now embraces¹ the following lines or branches of canals:

	Length Miles	Locks No.
Erie Canal, from Troy Lock in Hudson River to Tonawanda on Niagara River	340.7	35
Champlain Canal, from Waterford (pool of Troy dam) on Hudson River to Whitehall on Lake Champlain	62.6	11
Oswego Canal, from Three Rivers Point at head of Oswego River (confluence of Seneca and Oneida Rivers, 164 miles from Troy Lock) to Oswego on Lake Ontario	23.8	7
Cayuga and Seneca Canal, from Erie line at confluence of Seneca and Clyde Rivers to Ithaca on Cayuga Lake and Montour Falls on Seneca Lake, aggregating	92.8	4

Construction work on the enlargement as authorized by the Act of 1903 was begun in the spring of 1905 and is still in progress.

The Sault Ste. Marie Canal

One of the most important canals in the world - having regard of course for the comparatively large

1. U. S. War Department "Survey of Northern and Northwestern Lakes," Bulletin #35, 1926, p. 407 et seq.

volume of traffic annually passing through - is the Saint Mary's Falls Ship-Canal, commonly known as the "Sault Ste. Marie" or "Soo," around the rapids within the river connection between Lakes Superior and Huron. The canal is situated on the American side of the St. Mary's River, about 14 miles from Point Iroquois, at the foot of Lake Superior, and 48 miles from the head of Lake Huron.

The only waterway between Lake Superior and Lake Huron is the St. Mary's River,¹ which flows from the former at its eastern extremity, and discharges into the latter about thirty-seven miles east of Mackinac Island. The channel between the two lakes is, - depending upon which route is taken - about seventy-five miles long, and, before improvements, was obstructed in many places, particularly at the rapids of Saint Mary's. In their natural condition these rapids formed an insuperable impediment to navigation, except for

1. Cf. United States War Department, "Survey of Northern and Northwestern Lakes," Bulletin #35, April, 1926, pp. 105-120. This bulletin is published each year for "the benefit of mariners on the Great Lakes and connecting waters" and supplies a "full description of shore lines, outlying islands and shoals, harbors, bridges, storm-warning and coast-guard stations, magnetic phenomena, rules and regulations, and the particulars of constantly changing conditions not adaptable to prompt or adequate representation on the Lake Survey charts."

logs and small unburdened crafts, and compelled costly portaging of the increasing cargoes of furs and merchandise by the early trappers and traders of the Northwest.

The St. Mary's Rapids are about three-quarters of a mile long and half a mile wide, and have a fall ranging from 17 to 21 feet with the varying stages of water. From the head of the St. Mary's River at Point Iroquois the fall on the navigable water is only about 0.1 foot; in the three-quarter mile stretch of the Sault Rapids the fall is from 17 to 21 feet, as stated above; and from the foot of the rapids to the mean elevation of Lake Huron above the sea level, which point of elevation is reached at Mud Lake, thirty-five miles below the rapids, the fall is 2.3 feet; making in all a total fall varying from 19.4 to 24.4 feet.

In the year 1837, the Governor of the newly admitted State of Michigan directed the attention of the Legislature to the advisability and practicability of constructing a canal around the Sault Ste. Marie rapids. The Legislature that same year made provisions for a Board of Commissioners, to have in all seven members. The board was charged with the care and supervision of all artificial waterways and other public improvements

in the State. An Act also was passed in this same year authorizing the construction of a canal to surmount the Falls of St. Mary; this Act empowered the Governor to engage an engineer to make such surveys, examinations and estimates as in his good judgment were considered necessary for the immediate construction of a ship-canal. The engineer had instructions to submit a detailed report, accompanied by maps, profiles, and estimated expenditures of the proposed undertaking. A sum of \$25,000 was appropriated by the Legislature out of the State treasury to be applied in the satisfaction of expenses necessarily incurred in the construction of the canal.

Mr. John Almy was appointed by the Governor as the engineer to obtain the contemplated surveys, which were completed some time in December, 1837. The engineer suggested in his report that it was his opinion that three locks, each with a lift of six feet, were necessary in order to avoid an excessive hydraulic pressure on the gates and side walls. He proposed to build the canal at least 75 feet wide and 10 feet deep, and the locks at least 32 feet wide.

In January, 1838, the State Legislature passed a resolution petitioning Congress for a grant of land

to aid in the construction of a canal, but it went unheeded. In his message early in the year 1838, Governor Mason very solicitously directed the attention of the State Legislature to the carefully prepared report of the engineer and pressed that body to create further appropriations.

In April, 1838, the Legislature passed a supplementary Act commanding the Board of Commissioners to let the contract for the building of the St. Mary's Falls Canal, in whole or in part, and appropriating another sum of \$25,000 for the immediate prosecution of the project. A contract was negotiated by the Commission with Smith and Driggs of Buffalo in September, 1838. The contractor attempted to fulfill the terms set forth in the contract, but the War Department at Washington intervened with armed force, causing a cessation of construction work before it actually was under way. The objection broached by the War Department was to the effect that it would interfere with improvements already made by the United States Government, particularly the millrace, which was of prime importance.

In the year 1840, a Bill was brought into Congress as a consequence of a memorial made by the Legislature of Michigan praying for a grant of 100,000

acres of land which could be disposed of to obtain funds for the purpose of constructing a ship-canal at the Sault Ste. Marie, but Henry Clay made a denunciatory speech against the measure and it was voted down. But in spite of the violent opposition in Congress, a survey was ordered, which was made by officers¹ of the Topographical Engineers of the United States Army.

About the year 1845, and some time after the discovery and working of the copper and iron mines in the Lake Superior region, these rapids were found to be so serious an impediment to navigation and the profitable prosecution of these basic enterprises that through the persistent and urgent representations of both commercial and shipping interests Congress in 1850 was induced to make a grant of 750,000 acres of land to the State of Michigan to defray the expenses of constructing a canal and locks at this place. The grant of land was made by Congress only under the following conditions: that the canal be at least 100 feet wide, and 12 feet deep; that the locks be at least 250 feet long, and 60 feet wide; that

1. The original survey was made by Captain Augustus Canfield, Topographical Engineers, U.S.A.

work be commenced within three years from the date of the grant and finished within ten; that the tolls be limited to the actual amount necessary to keep the canal in good repair, after the expenses of construction had been defrayed; that all United States Government vessels pass free of tolls; and that the donated lands should not be sold until the exact location thereof had been established and filed. The State, without reservation, accepted the conditions embodied in the Deed of Gift and the grant of land, which was later handed over to a private company, which undertook to construct the canal for the proceeds of the land.

In 1853, a private company was organized to undertake for the State the construction of a ship-canal,¹ the pay to be the grant of lands, previously mentioned. On June 4, 1853, the ground was broken for the commencement of the work, and on May 21, 1855, the certificate of its completion was signed by the Commissioners; and the first canal, known as the State Canal, on the American side of the St. Mary's River was open for navigation. The first craft, the steamer "Illinois," Captain Jack Wilson, was passed through the locks on June 18, 1855. The cost was nearly \$1,000,000.

1. Cf. Purdy, op. cit., p. 19. (U. S. Tenth Census, 1883, Vol. IV, p. 749.)

The Canal was 5,400 feet long, 100 feet at the water line, and had 12 feet depth of water throughout the channel at mean low stage. The banks of the canal, except where it was cut through rock, were revetted with stone. The locks were two in number, situated at the eastern or lower end of the canal, and placed one in immediate prolongation of the other, each being 350 feet long, 70 feet wide, with $11\frac{1}{2}$ feet of water over the mitre sills, and a lift of nine feet. There was also a guard-gate at the head of the canal.

These locks were the largest constructed in the United States up to this time, and were deemed sufficiently large in every way to meet the needs of navigation, for their dimensions permitted the passage at one time of a tug and three vessels of ordinary size, which generally constituted a tow. But the rapidity with which industrial expansion was taking place about this time caused shipping companies to build larger and then still larger vessels, to meet the transportation demands so that by 1870 the facilities of the first canal no longer met the requirements of the steadily increasing volume of traffic on Lake Superior. Back in 1855, when the canal was completed, a tug and three vessels could easily lock through, but in 1870

only one vessel of the largest type could pass through the locks at one time, and even then the vessels could not load below the 12-foot draft; the number had also increased so that it became necessary to adopt some other method of getting the vessels past this point in the voyage to and from Lake Superior.

In July, 1870, the United States Congress appropriated a sum of money¹ for improving the canal at Sault Ste. Marie, and in August of that year a plan of construction was approved by the Chief of Engineers, which, after some alterations and other amendments, embraced the following improvements: the canal was deepened $3\frac{1}{2}$ feet below its then existing depth of 12 feet; the sloped walls were replaced by a timber revetment; and the guard gate was moved about 700 feet further upstream from its original position. The walls of the old lock, begun in 1855, were prolonged upstream a sufficient distance to permit of a pair of guard gates being hung. A new lock was also authorized under this plan, to be placed parallel to the old one and 100 feet distant therefrom; the chamber of this lock is 500 feet long between the quoins, 80 feet wide, with 17 feet of

1. Cf. Purdy, op. cit., p. 19 (749).

water over the mitre sills, and a lockage lift of 18 feet. The sills were placed one foot below the canal bottom so as to protect them from injury by vessels. A guard gate was placed at each end of the lock chamber, making the total length of the walls 717 feet. The westward approach at the head of the locks was made to gradually widen out from the guard gates at their new position, where the former width of the canal was retained, eastward until it became of sufficient width to permit the passage of vessels into either the new or the old locks. The entrance at the upper end of the canal which curved toward the lock was straightened to correspond with the projected elongation of the general alignment of the canal. In order to protect vessels against injury from contact with the rock sides of the canal a revetment of pier work, the material for which was pine timber one foot square, about 3 feet above mean water level, was constructed. The length of the enlarged canal is 7,000 feet, and its width is variable, the least being 108 feet at the movable dam, with a depth of water of 16 feet. The total cost of the canal enlargement and the new lock was about the sum of \$2,150,000.

The first contract for the improvement of the

canal, which ultimately resulted in its enlargement and the construction of the Weitzel Lock in 1881, bore the date of October 20, 1870; and the first stone of the lock, then the largest ship-canal lock in the world, was laid on July 25, 1876. The first craft to pass through this new lock was the steamer "City of Cleveland" (later renamed "City of Alpena"), Captain Albert Stewart, on September 1, 1881.

The original plans and specifications for the Weitzel Lock were made under the supervision of General Orlando M. Poe, United States Army, but they were later subject to some modification under the direction of General Godfrey Weitzel, United States Army. The entire work from the time of its commencement was in local charge of the Assistant Engineer, Mr. Alfred Noble.

Governor Crosswell of the State of Michigan, in his annual message to the Legislature in 1879, made the following statement: "The 23rd of June last marked a quarter of a century since ground was broken for the construction of the Saint Mary's Falls Ship-Canal. The tonnage through it has increased from 106,296 tons in 1855 to 1,667,136 in 1878 (1879, 1,677,071 tons). Its gross revenues during this same time have multiplied

by ten; more than 5,000 vessels, many of them of large tonnage, have passed its locks in a single year making an average of one boat every two hours and ten minutes during the time of navigation. The Legislature of 1869, by joint resolution, authorized the board of control to transfer the canal to the United States."¹

On June 14, 1880, the United States Congress authorized the Secretary of War to receive the canal from the State of Michigan. The transfer was effected on June 6, 1881, and since that time the canal has been in the possession and under the control of the Federal Government, and all vessels have been passed through free of toll charges. At first the rate was 6½ cents per registered ton, but as time went on this was gradually reduced to 2½ cents; and the minimum charge for any lockage was also reduced from \$5 to \$3.² Between the time of the completion of the State Canal in 1855 and the transfer of it to the United States Government in 1881 the tolls collected amounted to about \$798,000.

"For twenty-five years," writes Mr. Thomas Purdy, "the State of Michigan had conducted the business of

1. Cf. Purdy, op. cit., loc. cit.

2. "St. Lawrence Waterway," (Senate Document No. 114, 67th Congress, 2nd Session.)

the canal, charging vessels only such tolls as would pay the operating expenses and repairs, the great aim being to make the tolls as light burden as possible. The United States, having offered to take the canal and manage it free of tolls, the State accepted the proposition; but considering the interest which the State has in the business most affected in making such a transfer, those interests were guarded by requiring that the canal be made forever free beyond the power of reversal, except on condition of reversion to the State, should the policy of the Government become changed regarding internal improvements."¹

At the time of construction of the Weitzel Lock in 1881 it was considered to be the ultimate in lock design and construction. This lock, as previously mentioned, was 515 feet long, 80 feet wide, narrowing down to 60 feet at the gates. It is now too small for a large majority of vessels passing through the St. Mary's River, and is only used in emergency cases. At the time of its construction the estimated capacity was 96 vessels in 24 hours. Records show that up to 1888 the greatest number of vessels to pass through the canal in any one day was 84 vessels, on June 14, 1887. The use

1. Cf. Purdy, op. cit., p. 19, (749).

of the lock was suspended on October 18, 1914; but on account of the exigencies of the late War it was in commission between June 17 and October 31, 1918. Since that date, however, its use has been discontinued.

The last boat to be locked through the old locks was the steamer "Annie Clark," Captain Edward Martin, on November 2, 1886. In the spring of 1887 these two locks of the old State Canal were torn down and replaced by a larger and more modern single lock, having dimensions of 800 feet long by 100 feet wide, with a 21-foot depth of water over the mitre sills, and a lift of 18 feet. This lock, called the "Poe" lock, when opened to commerce on August 3, 1896, was considered to be the largest one in the world, and the estimated capacity of it at that time was four vessels, each 300 feet long and 46 feet wide, the largest size of lake vessel then in service, at one lockage. It was built at a cost of about \$3,000,000.¹

The canal was also deepened at this time to 25 feet. General Poe was the engineer then in charge of the improvements. Simultaneously with the construction of the Poe Lock there also was built through the

1. Cf. The Encyclopaedia Americana, 1928, Vol. 24, pp. 318-319.

north side of St. Mary's Island the Canadian Sault Ste. Marie Canal, having a single lock 900 feet long, 60 feet wide, with about 20 feet of water over the mitre sills.

During the period from 1892 to 1903 the Canadian and American Governments spent many millions of dollars in laying out a new and straighter route through Hay Lake, West Neebish, Middle Neebish, and other channels, eliminating many of the turns and giving dredged areas for a distance of 30 miles. This improvement in navigation was one of the principal causes for the reduction in the freight ton cost through the Sault Ste. Marie Canal from 13.47 mills in 1882 to 3.53 mills in 1909.¹ The improvement in the West Neebish channel was begun in 1903 and the channel opened for navigation in 1908; it is used for down-bound traffic.

By the Act of March 2, 1907, further work of immense importance consisting of widening and deepening the canal - South Canal - to a 25 foot depth above the head of the locks and in the Middle Neebish channel, the construction of the new canal - the North Canal - and the construction of the well-known "Davis" Lock was provided for, and work was started in the following

1. Cf. The Encyclopaedia Americana, 1928, Vol. 24, loc. cit.

year. This project was practically completed in the year 1914 after an expenditure of nearly \$5,000,000.

The South Canal was made 500 feet wide at the western entrance, 270 feet wide at the basin, 108 feet wide at the lock gates, and 660 feet wide at the lower entrance between Fort Brady and the east centre piers. The dredged channel through the Middle Neebish was made 600 feet wide from the upper angle of Little Mud Lake to near the dike, and 300 feet wide in the rock cut along the dike, with 22 feet of water over the lock sills at the mean low stage level of Lake Huron. The North Canal was made about 400 feet wide at the upper entrance, 270 feet at the basin above the "Weitzel" and "Poe" locks, with two passages, each 108 feet wide, on either side of Bridge Island at the lock gates. The excavations for the "Davis" Lock were practically completed early in 1912. This lock is 1,350 feet long between the gates (available length 1,300 feet), 80 feet wide, and has a minimum depth of $24\frac{1}{2}$ feet of water over the sills. It was constructed parallel to and at a distance of 240 feet north of the "Poe" Lock, and it was opened for navigation on October 21, 1914. A separate waterway was also provided to feed the new lock.

Since 1895 the largest freight vessels had been

using the Canadian canal, but the opening of the new lock on the American side in 1914 resulted in these vessels again taking advantage of the United States canal which offered better facilities.

The Act of 1907 also provided for a fourth lock of the same dimensions as the "Davis" Lock, but it was not until the Act of July 25, 1912, that an appropriation was made for its construction, and the work started within a short time thereafter. This lock, called the "Sabin" Lock, is north of the "Davis" Lock and parallel to it; it is of the same dimensions, and also forms a connection with the North Canal. It was opened for navigation on September 18, 1919, and its total cost was \$3,275,000. The immense length of the "Davis" and "Sabin" locks makes it possible for as many as five ships to be locked through at one time.

The maximum traffic passing through these five locks (4 American and 1 Canadian) in any one year was 91,888,219 net tons in 1916. In 1927 the tonnage had decreased to 83,344,064 net tons of which about 3,000,000 passed through the Canadian Sault Ste. Marie Canal.¹

1. Encyclopaedia Britannica, 14th Edition, Vol. XX, pp. 11-12.

Sturgeon Bay and Lake Michigan Ship Canal

This canal¹ is located on the west shore of Lake Michigan about 47 miles in a north-east direction from Green Bay City, and about 128 miles in a northerly direction from Milwaukee. It consists of a basin having an area of about 12 acres enclosed by breakwaters at the Lake Michigan end, and a dredged channel having stone retaining walls to hold in place the sloping embankment, making connection at the west end with deep water in Sturgeon Bay. At the point where this canal was built a neck of land about $1 \frac{3}{8}$ miles wide, having a maximum elevation of 28 feet above the mean low level, separated Lake Michigan from Sturgeon Bay.

The canal and channel in Sturgeon Bay were originally constructed by private enterprise. It had at first a width of 100 feet at the water surface and a depth of approximately 12 feet throughout the canal proper and the channel. In 1893 the United States Government took over the canal, paying for it the sum of \$323,419.41.

In 1903 the Federal Government undertook the enlargement of this waterway by providing an outer

1. Cf. International Joint Commission Report on the "St. Lawrence Navigation and Power Investigation," 1921, pp. 28-29.

harbor protected by two converging breakwaters, each having a length of 1,344 feet, extending from the shore on either side of the Lake Michigan end of the canal; for a channel extending from deep water in the Lake to the canal entrance at the shore line, a total length of 1,300 feet, varying in width from 600 feet at the outer end to 160 feet at the canal entrance; for a canal faced with masonry 7,200 feet in length, varying in width from 160 feet to 250 feet; and for a channel from the westerly end of the canal to deep water in Sturgeon Bay, a distance of four miles, having a minimum width of 200 feet; the prevailing depth of water in all channels to be 19 feet below the low-water datum. This extensive project was completed in 1919 at a total expenditure, including the original purchase price, up to that date of \$653,000.

As this canal and its connecting channels form a through waterway between Lake Michigan and Sturgeon Bay, there are no terminal facilities. The nearest port of the route is the city of Sturgeon Bay, some four miles distant from the west end of the canal.

The principal reason for constructing this waterway was to shorten the distance from the ports on the south-east and west shores of Lake Michigan to

Menominee and Green Bay Harbors by about 50 to 70 miles respectively. Most of the car ferry traffic between Frankfort and Menominee moves by way of this canal.¹

Keweenaw Waterway

The Keweenaw Waterway² is a navigable channel, partly natural and partly artificial, with a minimum width of 120 feet. It is 25 miles long and runs across the peninsula known as Keweenaw Point, Michigan, with its upper or western entrance 165½ miles east of Duluth, and its lower or eastern entrance 205½ miles west of Sault Ste. Marie, Michigan. Both entrances are protected by breakwaters, and harbors of refuge with mooring piers have been built at each end.

At the time (August 3, 1891) that the United States Government purchased this waterway only 13-foot navigation was available for the passing of vessels, and the channel was narrow and crooked, with many sharp bends; it was poorly lighted and marked, rendering navigation at night hazardous, and the entrance piers were in a very unsatisfactory condition. The revetments were

1. The Annual Report of the Chief of Engineers, U.S. Army, 1928, pp. 1352-1354.

2. Cf. U. S. War Department, "Survey of Northern and Northwestern Lakes," Bulletin No. 35, April, 1926, p. 57.

St. Clair Flats Canal

The St. Clair Flats Canal,¹ Michigan, is located at the outlet of the south channel of the St. Clair River delta. In their original state the principal channels of the delta afforded good water for navigation, but they were all obstructed at their entrances by sandy bars in Lake St. Clair, over which the depths were only from two to six feet. The shortest route for through navigation was by way of the South Pass or channel; this was dredged to a depth of 12 or 13 feet during the years from 1855 to 1859, but it soon became useless by filling in.

Work in the channel as it exists today began in 1867 when a project was started for the dredging of a straight channel 300 feet wide, with dikes for protection, from deep water in Lake St. Clair to deep water in the mouth of the South Pass; this canal was used by vessels in 1870, but was formally opened in July, 1871. The channel had 13 feet depth originally, which was increased to 16 feet in 1873, 18 feet in 1886, and 20 feet in 1892.

The river and harbor act of June 13, 1902, contained

1. U. S. War Department "Survey of Northern and Northwestern Lakes," Bulletin #35, April, 1926, pp. 312-313.

a provision for two separate channels, one for upbound and one for downbound traffic. This was accomplished by the dredging of a new channel along the west side of the old canal, 21 feet deep and 300 feet wide. This new channel, called the "west channel" was opened for navigation in September, 1906.

The present canal consists of the two channels described above, which extend from deep water in the South Channel to deep water in Lake St. Clair, a distance of about $3\frac{1}{2}$ miles. At the upper end the two channels are separated for a distance of 7,221 feet by a sand dike 100 feet wide with revetments of sheet piling on each side. A dike of a similar nature formerly existed on the east side of the east channel, but this was removed in 1920, and in its place was constructed an earth mound about 20 to 25 feet wide on top and having riprapped slopes. The upbound channel (east) has an available width of 294 feet between the dikes. The downbound channel has a width of 300 feet. Below the dikes the two channels are joined and form one broad channel, at first with a width of 700 feet and, within a distance of 10,000 feet, widening to 800 feet. At unprotected points above and below the separating dikes the channels are subject to shoaling and filling in;

for that reason it is necessary to dredge constantly in order to maintain the full depth of 20 feet.

The Old Channel is still in use by small vessels, yachts, and other boats of light draft which are thus able to avoid passing through the canal channels which are used by numerous large carriers. Its width, however, is narrow and irregular, and the depth is not more than 11 feet. At its outer end the Old Channel is $1 \frac{3}{8}$ miles northwest of the canal, and its upper end connects with the South Channel just above the dikes. From Lake St. Clair, after a distance of $2 \frac{3}{8}$ miles it connects with the main channel.

The Grosse Pointe Channel is a straight cut of nearly 6 miles and runs through the shoals at the foot of Lake St. Clair to deep water at the head of the Detroit River. It is 800 feet wide and 21 feet deep for the entire length and width. The natural depth of the water outside of the channel is from 12 to 15 feet.

Black Rock Channel

Black Rock Channel¹ provides a navigable waterway on the United States side for large vessels around

1. U. S. War Department "Survey of Northern and Northwestern Lakes," Bulletin #39, April, 1930, pp. 377-378.

the rapids and shoals in the head of the Niagara River. The entrance from Lake Erie consists of a navigable channel 21 feet deep from Buffalo harbor to the north entrance of Erie Basin, and thence northwesterly about 2,190 feet to the head of Black Rock Canal at the foot of Maryland Street, Buffalo, having a varying width of from 400 to 1,000 feet. Thence the Niagara River channel extends for a distance of 9.2 miles to the foot of Tonawanda Island, having a minimum width of 400 feet and terminating in a turning basin approximately 1,230 feet long by 1,050 feet wide.

Included in the category of Black Rock Channel is also a channel to the Tonawanda inner harbor having a length of 680 feet, a width of about 400 feet, and a depth of 16 feet, and another channel in Tonawanda Creek about 1,400 feet long and 180 feet wide.

The Black Rock Canal extends from the foot of Maryland Street for $3\frac{1}{4}$ miles along the Niagara River front to the Black Rock Lock, 650 feet long, near the foot of Squaw Island. The canal has been dredged to a depth of 21 feet, with a minimum width of 200 feet, except at curvatures where it is about 240 feet.

Although the Black Rock Lock, which connects the Canal with the River near the foot of Squaw Island, is

650 feet long between quoin posts and 70 feet wide, with 22 feet depth of water over the mitre sills; its useable length is only 625 feet by 68 feet in the clear, and its average lockage lift is something over 5 feet. The whole is operated and lighted by electricity.

The ship canal was completed in August, 1914, and since that time has been used by the largest lake vessels and by canal barges, tugs, and motorboats, to avoid the turbulent waters of the Niagara River.

The canals of the United States not connecting boundary waters have so little bearing on the subject of the Great Lakes-St. Lawrence Waterway and the project which is now under consideration by the governments of the United States and Canada that they are beyond the scope of this thesis, and for that reason no mention is made of them herein.

CHAPTER VI

THE GREAT LAKES - ST. LAWRENCE WATERWAY PROJECT

Importance of the System

The Great Lakes are very often referred to as the Mediterranean of the New World. It is true that both of these bodies of water fall within the major classification of deep depressions in the surface of the earth, filled with water; beyond this one point it is very difficult to formulate any analogy, for these two inland waterways have very little, if anything, except volume of traffic, in common. The Mediterranean is bordered on the south by the Great Sahara Desert, while to the north lie the highest mountains of Europe, sloping to the very shores of this sea which is used chiefly as a passageway. The Great Lakes, however, are surrounded on every side by land the fertility of which is exceedingly great, while its abundance and variety of natural resources equals and probably surpasses that of any other region of similar area. The history of the territory within

the St. Lawrence drainage basin, which includes that surrounding the Great Lakes and the River St. Lawrence, does not fill the pages of antiquity, but there is a glorious future before it, if its people are sufficiently wise to foresee and grasp the opportunities that kindly Nature has so lavishly bestowed upon them.

Yet another very important factor, the significance and influence of which greatly favors the inevitable forward progress of commercial and industrial development within the region of the Great Lakes, is that the people who live there speak one language, have similar institutions and laws, and all reside under free governments. They work together with one common purpose, can and will achieve a higher degree of individual welfare than has ever been attained by any other group in the world. It has been prophesied that when these people become thoroughly acquainted with the importance of a deep waterway route into the interior of the continent, they will not permit a few obstacles that are easily removeable to block forever their passage to the sea.

The Great Lakes outrank any other body or connected group of fresh water bodies in the world, both with respect to size and volume of traffic. For a number of years, however, the business interests in this

region have argued that industrial and agricultural growth in their territory has been retarded because of the heavy cost of transporting their goods to the world markets. In the belief that their transportation costs could be materially reduced if they had access to the sea by an all-water route, the St. Lawrence Waterway project has been proposed. This project is unique as a natural commercial highway from the continental interior for it would move the Atlantic sea base, now as far as Montreal, inland, and save approximately one thousand miles of rail haul by permitting ocean traffic to penetrate into the very heart of the North American continent. The principal port on the waterway route is Montreal, nearly one thousand miles inland from the mean Atlantic coast at the Strait of Belle-Isle. This port, the largest inland port in the world and the next to the largest in North America, is located advantageously with respect to distances from European ports, as will be seen from a study of the accompanying tables.

and of the Comparative Route Distances

ter I The distance from Montreal to Chicago is 1,244 statute miles; while from Montreal to Port Arthur the distance is 1,215 miles. Of the total distance from

Montreal to the head of the Great Lakes approximately 360 miles are in restricted channels and canals - 183 miles in the St. Lawrence River; 25 miles in the Welland Canal; 31 miles in the Detroit River; 17 miles in Lake St. Clair; 41 miles in the St. Clair River, and from 63 to 75 miles, according to the route taken, in the St. Mary's River and the Sault Ste. Marie Canal. This leaves about 850 statute miles of open water navigation between Montreal and Port Arthur by the shortest route.

The tables on the following pages show the distances between the various ports on the Great Lakes-St. Lawrence route, the distance of the lake ports to Liverpool, and the comparative distances from the principal Atlantic ports to Liverpool, England. The map next following these three tables shows the Great Lakes and the St. Lawrence River as far as Montreal, with the principal ports, distances, and terminals along the entire route. Maps of the Dominion of Canada, showing the route to the Strait of Belle-Isle, and of the United States will be found preceding Chapter I.

The St. Lawrence Waterway Project

The project may be stated summarily as a scheme

TABLE VIII

DISTANCE BETWEEN PORTS OF THE GREAT LAKES AND MONTREAL *
(Distance in Statute Miles)

P O R T S	Montreal	Toronto	Kingston	Port Arthur	Port Colborne	Ogdensburg	Oswego	Buffalo	Cleveland	Detroit	Erie
Port Arthur and Fort William, Can.	1,215	904	1,038	---	848	1,096	1,018	864	711	604	795
Duluth, Mich.	1,337	1,026	1,160	195	970	1,218	1,140	986	833	726	917
Marquette, Mich.	1,102	791	925	171	735	983	905	751	598	491	682
Sault Ste. Marie	943	631	765	273	575	824	745	592	438	331	522
Milwaukee, Wis.	1,179	867	1,002	621	812	1,060	982	828	675	568	759
Chicago, Ill.	1,244	933	1,067	686	877	1,125	1,047	893	740	633	824
Port Huron, Mich.	674	363	762	542	306	555	477	322	170	62	253
Detroit, Mich.	612	301	435	604	244	493	415	261	108	---	191
Toledo, Ohio	605	293	427	658	237	486	407	254	96	54	185
Cleveland, Ohio	528	217	351	711	160	409	331	176	---	108	102
Buffalo, N.Y.	390	79	213	864	22	271	193	---	176	261	78
Toronto, Ont.	338	---	161	904	57	219	145	79	217	301	122
Oswego, N.Y.	227	145	55	1,018	171	108	---	193	331	415	236
Ogdensburg, N.Y.	120	219	63	1,096	249	---	108	271	409	493	314

* Compiled from U. S. War Department, Corps of Engineers, "Survey of Northwestern Lakes," Bulletin No. 39, April, 1930, pp. 8-11; and U. S. Department of Commerce, "Distances Between United States Ports," Serial No. 444. (Table No. 30, p. 36.)

TABLE IX

DISTANCES, LAKE PORTS TO LIVERPOOL, ENGLAND *
via Montreal, Strait of Belle-Isle and
G. C. to Malin Head

NAME OF PORT	M I L E S	
	Nautical	Statute
Gargantua Harbor, Ont.	3,688	4,241
Michipicoten Harbor, Ont.	3,714	4,271
Rosspoint, Ont.	4,203	4,834
Port Arthur; Fort William, Ont.	3,846	4,423
Two Harbor, Mich.	3,931	4,521
Duluth, Mich.	3,951	4,544
Marquette, Mich.	3,747	4,309
Sault Ste. Marie, Mich.	3,609	4,150
Milwaukee, Wis.	3,814	4,386
Chicago, Ill.	3,870	4,451
Port Huron, Mich.	3,375	3,881
Detroit, Mich.	3,321	3,819
Toledo, Ohio	3,315	3,812
Cleveland, Ohio	3,248	3,735
Port Stanley, Ont.	3,203	3,684
Port Colborne, Ont.	3,109	3,575
Buffalo, N.Y.	3,128	3,597
Toronto, Ont.	3,083	3,545
Kingston, Ont.	2,947	3,389
Oswego, N.Y.	2,986	3,434
Ogdensburg, N.Y.	3,893	3,327

* Compiled from U. S. War Department, Corps of Engineers, "Survey of Northern and Northwestern Lakes," Bulletin No. 39, April, 1930. pp. 8-11; U. S. Department of Commerce, "Distances Between United States Ports," Serial No. 444 (Table No. 30, p. 36); U. S. Hydrographic Office, "Table of Distances Between Ports: via the Shortest Navigable Routes." H. O. 117. Washington, 1927.

TABLE X

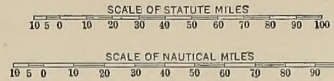
COMPARATIVE DISTANCES FROM PRINCIPAL
ATLANTIC PORTS TO LIVERPOOL, ENGLAND *

PORT	ROUTE	EASTBOUND	
		Nautical Miles	Statute Miles
Fort Churchill, Man.	via Hudson's Bay Straits	2,936	3,376
Montreal	via Strait of Belle-Isle & G.C. to Malin Head	2,785	3,207
Quebec	via Cape Race, Nfld.	3,939	3,380
	via Strait of Belle-Isle & G.C. to Malin Head	2,646	3,047
	via Cape Race, Nfld.	2,801	3,231
Halifax		2,510	2,891
Saint John, N.B.	Winter; eastbound	2,817	3,244
	Summer; "	2,922	3,365
Portland, Me.	Winter; "	2,885	3,322
	Summer; "	3,022	3,480
Boston, Mass.	Winter; "	2,928	3,372
(Navy Yard)	Summer; "	3,058	3,521
New York, N.Y.	Winter; "	3,107	3,578
(The Battery)	Summer; "	3,219	3,707
Philadelphia, Pa.	Winter; "	3,250	3,743
	Summer; "	3,362	3,871
Baltimore, Md.	Winter; "	3,393	3,907
	Summer; "	3,488	4,017
Savannah, Ga.	Winter; "	3,613	4,161
	Summer; "	3,686	4,245
Jacksonville, Fla.	Winter; "	3,692	4,252
	Summer; "	3,765	4,336
Port Tampa, Fla.	Winter; "	4,299	4,951
	Summer; "	4,372	5,035
Mobile, Ala.	Winter; "	4,544	5,233
	Summer; "	4,617	5,317
New Orleans, La.	Winter; via South Pass, south of Dry Tortugas and Straits of Florida	4,597	5,294
	Summer; via same route	4,677	5,386
Galveston, Tex.	Winter; eastbound	4,773	5,496
	Summer; "	4,846	5,580
Belle Isle Light, Nfld., to Lands End, England		1,836	2,114

* Compiled from H.O. No. 117. Table of Distances Between Ports: via the Shortest Navigable Routes; as determined by the Hydrographic Office, United States Navy Department, 1927.

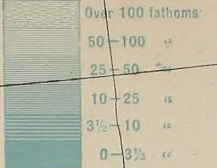
THE NORTHERN AND NORTHWESTERN LAKES

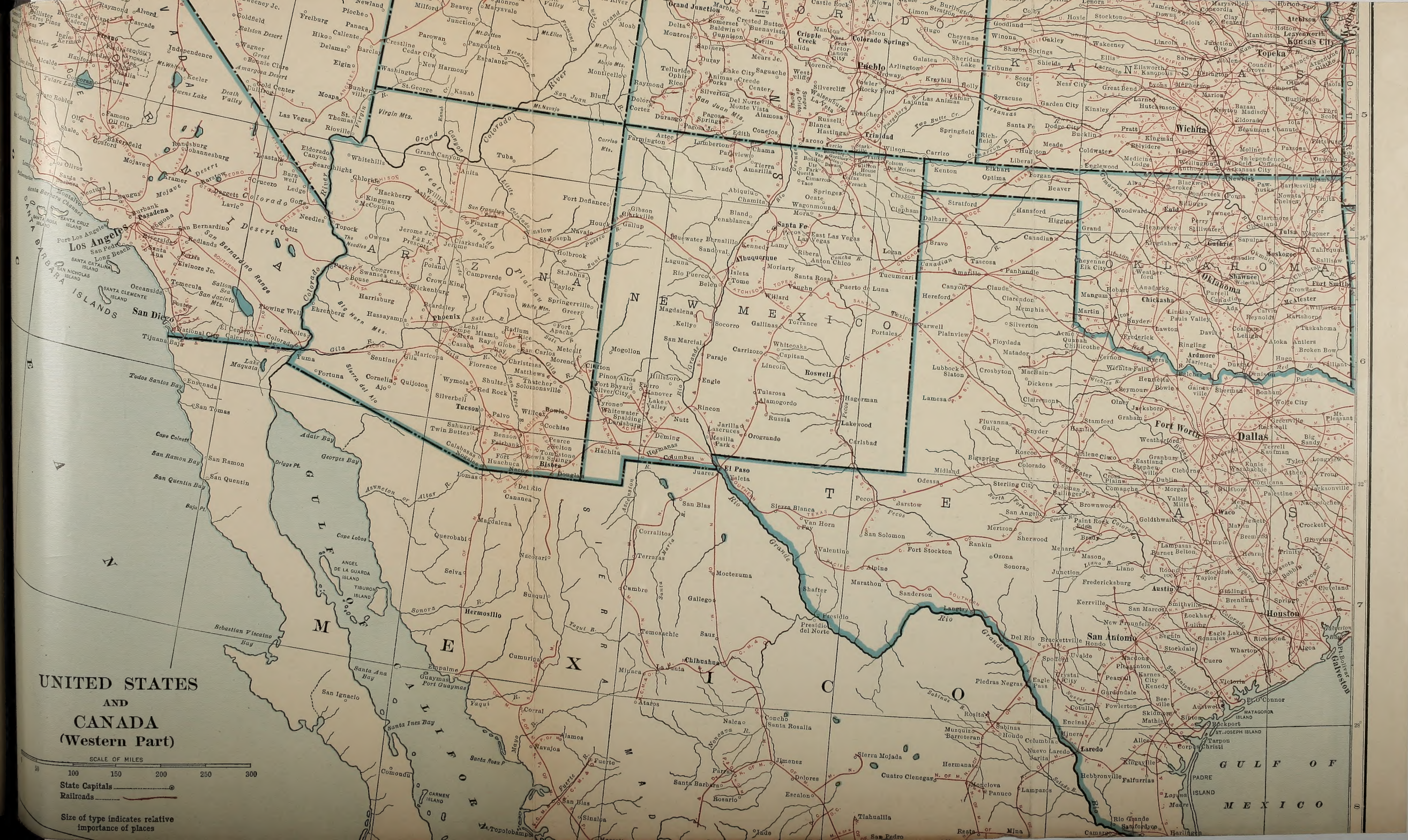
Including
CANALS AND TRIBUTARY NAVIGABLE STREAMS



— Canals — Navigable Rivers
— Distances between Ports in Statute Miles
--- Railroad Car Ferries

DEPTHS OF THE LAKES





to connect the Atlantic Ocean with the Great Lakes of North America by means of a ship chammel between Father Point and Montreal, and a series of ship canals and channels between Montreal and Lake Ontario; all to be of a depth sufficient to allow the unrestricted navigation of ocean-going vessels having a draught up to 25 feet of water. Such a depth would admit 88 per cent of all ships now entering ports on the Atlantic seaboard.¹ As will be observed by reference to the maps following pages 308 and 324 respectively, it is principally in the upper reaches of the St. Lawrence River, which lie between Lake St. Francis and Lake Ontario, that the impediments to unhampered navigation are to be found. In these reaches it is contemplated that the required depth could be obtained by damming the river and thereby flooding out the intervening rapids.

The development of the waterway would, by the damming method, necessarily also become a development of the huge hydro-electric power from the rapids which now

1. Cf. Report of Chairman of United States St. Lawrence Commission, "St. Lawrence Waterway Project," Senate Document No. 183. 69th Congress, 2nd Session, 1927. This document also includes the Report of Joint Board of Engineers on the St. Lawrence Waterway Project. (p. 3 of Chairman's report.)

form an obstruction to navigation on the river.¹ The complete power development derived from the River would provide a total of approximately 5,000,000 installed horsepower of electricity, of which about one-half would be generated in the upper rapids along the International Boundary between the State of New York and the Province of Ontario; the remainder would be developed from the lower rapids which are wholly within the Dominion of Canada.²

This hydro-electric power development is the largest possible one that can be produced on the continent of North America. Favorable interests have broached the contention that the development of the river for the purpose of obtaining the power alone would in itself encompass the cost of construction of the shipway. Dams necessary for the creation of power would at the same time form a series of pools in place of present rapids which, with the supplement of locks and short lateral canals, would become the proposed shipway.

Construction would require from seven to eight

1. "St. Lawrence Waterway Project," Senate Document No. 183, p. 4.

2. Ibid., loc. cit.

years from the time that actual work was commenced,¹ but it is a sane assumption that a much longer period of time would be consumed if contrasted with previous and smaller projects.

The Joint Board of Engineers in their 1927 report upon the subject of a deeper waterway stated the cost of improving the main navigation channels between and through the Lakes, so as to provide a depth of 25 feet, including all compensating works constructed in furtherance of the project, was then estimated at the sum of \$44,700,000, not including the cost of the New Welland Ship Canal.²

Description of the St. Lawrence Waterway

The Great Lakes of North America and their connecting waterways form a natural transportation highway; they are the most important unit of inland waterway communication in the world and are considered of great economic importance in the development of the interior of the continent. They are the largest body of fresh water in the world, having an area of water-surface of over 96,000 square miles, or about 32 per

1. Report of Joint Board of Engineers on the St. Lawrence Waterway Project (Senate Document No. 183, 69th Congress, 2nd Session, 1927). p. 59.

2. Ibid., loc. cit.

ST LAWRENCE DRAINAGE AREA TO GALOP RAPIDS		
	Square Miles	Percent
Canada.....	122,030	41
United States.....	176,050	59
Total.....	298,080	100

RELATIVE LAKE AND LAND SURFACE		
	Square Miles	Percent
Lake Surface.....	95,160	32
Land Surface.....	202,920	68
Total.....	298,080	100



cent of the surface of the drainage basin, and have a shore line of more than 8,300 miles. Their drainage basin has an area of about 298,000 square miles, of which about 176,050 square miles or approximately 59 per cent lies within the boundaries of the United States. The Great Lakes constitute, with the rivers St. Louis, Pigeon, and Nipigon, leading into Lake Superior from the west and northwest, the source of the St. Lawrence River, and with it form an inland waterway system extending from the very heart of the continent to the sea. The international boundary between the United States and Canada runs through the middle of all the lakes and connecting waterways, except Lake Michigan, which is wholly within American territory.

The dimensions, area of water surface, elevations, and other relative details of each of the lakes and connecting rivers are given in Table XI. This data was compiled from information obtained by consulting a bulletin (No. 39) entitled "Survey of Northern and Northwestern Lakes," which is published each year by the United States Lake Survey Office, Detroit, Michigan, and charts issued by the same office.

Lake Superior, the farthest from the sea, the largest of the Great Lakes, and the highest - 602 feet

TABLE XI

THE DIMENSIONS, ETC., OF THE GREAT LAKES AND CONNECTING WATERWAYS *

LAKES	Length Miles	Width Miles	Area of Water surface Square Miles	Total area of basin Square Miles	Maximum recorded depth Feet	Mean elevation approved low water datum Feet	Ordinary fluctua- tions; water Feet	Average date of opening of navi- gation Month & Day	Average date of closing of navi- gation Month & Day
Superior	350	160	31,820	80,900	1,290	601.6	2.5	Apr. 23	Dec. 11
Michigan	307	118	22,400	69,040	870	579.6	2.8	Apr. 12	Dec. 15
Huron	206	101	23,010	72,420	750	579.6	2.6	Apr. 8	Dec. 16
St. Clair	26	24	460	6,420	23	573.8	--	Mar. 28	Dec. 19
Erie	241	57	9,940	34,680	210	570.8	3.0	Mar. 29	Dec. 18
Ontario	193	53	7,540	34,630	738	244.5	3.3	Apr. 6	Dec. 18

RIVERS	Length Statute Miles	Minimum Width Feet	Maximum Width Feet	Limiting Depth at low water Feet	Current in navigated sections Miles per hour	Discharge at mean stage Cubic foot seconds
St. Mary's	63-75	300	24,000	21	1 - 3½	---
Straits of Mackinac	30	10,900	100,000	110	---	47,000
St. Clair	40	800	5,100	20	1 - 5	196,000
Detroit	31	1,900	19,000	22	1 - 6	208,000
Upper Niagara	20	1,600	7,500	10-23	1 - 7	206,000
Lower Niagara	15	250	2,500	30	1 - 2½	240,000

* Previous to improvements, the mean stage discharge of the St. Mary's river was about 75,000 cubic feet per second. The river flow is now controlled by regulating works.

above tidewater, discharges its waters into Lake Huron through the rapids of St. Mary's Falls and the St. Mary's River, where, in their passage of sixty-three miles, they fall twenty-one feet. Lake Michigan is connected with Lake Huron by the wide and deep Straits of Mackinac, and together form the largest unit level of the St. Lawrence River system, having a combined area of about 45,000 square miles, or over 13,000 square miles larger than the area of Lake Superior, and without exception the largest body of fresh water at one level in the world. Lake Huron discharges its waters through the St. Clair River into Lake St. Clair, a basin with 460 square miles of water surface and 6,420 square miles of drainage area, so shallow that dredged and canalized channels must be used through much of its extent, and thence by way of the Detroit River into Lake Erie; the total fall from Lake Huron to Lake Erie averages only around nine feet in the intermediate distance of eighty-six miles. Lake Erie discharges into Lake Ontario by way of the Niagara River in which comes the one great break in the level of the entire system, that of the Niagara escarpment where the tremendous volume of water from the upper Lake falls 326 feet in its descent through the river

to Lake Ontario; nearly one-half of this great fall occurs at the cataract of Niagara. From the foot of Lake Ontario, 246 feet above sea level, the St. Lawrence, carrying the waters of that lake, flows onward 533 statute miles in a northeasterly direction to Father Point, which marks the river's transition into the Gulf of St. Lawrence. For a distance of sixty-eight miles from the outlet of Lake Ontario the river¹ flows as a placid stream with an even slope; after that a long series of rapids occur, terminating a little above Montreal, 114 miles farther downstream at the head of ocean navigation.

1. Cf. U. S. War Department, "Survey of Northern and Northwestern Lakes," Bulletin No. 39, (1930), pp. 423 and 424.

"This portion (above Montreal) of the St. Lawrence River may properly be divided into three sections: The upper section, 62 miles long from its head to Ogdensburg, through which there is free navigation; the middle section, about 54 miles long from Ogdensburg down to the mouth of the St. Regis, through which navigation is interrupted by rapids and shoals around which canals have been built by the Canadian Government, shoals removed, aids to navigation established, &c. The river embraced by the two sections mentioned above separates the United States and Canada. The third or lower section, from the mouth of the St. Regis to Montreal, is entirely in Canadian territory. This section has been improved by the Canadian Government by building canals about the rapids, removing shoals, and establishing aids to navigation. It is 66 miles in length from St. Regis to Montreal, the latter being at the head of ocean-going navigation. A good channel of deep water is available from the head of the river to Ogdensburg. The fall or slope in this length of 62 miles is only 1 foot.

The first 116 miles of the St. Lawrence River traverses the line of demarcation between the United States and Canada; the remainder of its course passes wholly through Canadian territory. The port of Montreal is downstream from Lake Ontario 183 statute miles.¹

The distances by the ordinary vessel routes from Duluth and Port Arthur, at the head of Lake Superior, to Kingston at the head of the St. Lawrence River, are 1,160 statute miles and 1,038 statute miles respectively, while the distance from Chicago to Kingston is 1,067 statute miles.²

Navigation from Lake Superior to Lake Huron is effected by a passage through the St. Mary's River, 63 miles in length. A little more than one mile (7,400 - 7,515 feet) of this passage is by a canal at Sault Ste. Marie, 20 miles is through restricted channels in the narrowest and shallowest sections of the river, and the balance is open river. The canal actually consists of two parallel canals, one for southbound and one for

1. Report of Joint Board of Engineers on St. Lawrence Waterway project, November 16, 1926, p. 40. (69th Congress, 2nd Session, Senate Document No. 183); and U. S. War Department, "Survey of Northern and Northwestern Lakes," Bulletin 39, April, 1930.

2. Vid. Table p. 291 supra. And also Map of the "Northern and Northwestern Lakes" subsequent to page 293 supra.

northbound traffic moving past the falls of the St. Mary's River, with 24 feet minimum depth. There is also a Canadian canal on the north side of the river. Channels have been dredged through St. Mary's River, and through the St. Clair River, Lake St. Clair, and the Detroit River, where at normal lake levels the minimum depth of water is 20 feet; but the extreme low levels reached by the Lakes during the past decade or so has resulted in channel depths of less than 20 feet at times. It is reported that during the latter part of the navigation season of 1925 the available depth was 18 feet, and that at no time throughout 1925 did the maximum depth between Lake Superior and Lake Erie permit the navigation of a vessel whose draft exceeded 19 feet.

The total length of dredged channels between Lake Superior and Lake Erie is nearly 100 miles. Their combined cost - that is for Canada and United States - for capital account only, including the costs of the Sault Ste. Marie locks, has been as follows:

Expended by Canada to March 31, 1925	\$5,560,009
Expended by United States	
to June 30, 1926	44,721,319
Total	<u>\$50,281,328</u>

Navigation, on its way to Lake Ontario, passes

through the Welland Canal, constructed and operated by the Dominion of Canada. The present Welland Canal parallels the Niagara River and affords a depth of 14 feet at normal lake levels. Better navigation facilities are now provided by the construction of the new Welland Ship Canal, which is 25 miles in length, with seven locks, each having a lift of $46\frac{1}{2}$ feet, and one guard lock; its depth is 27 feet, with 30 feet over the sills so as to permit subsequent enlargement of the canal reaches.

From the outlet of Lake Ontario to the port of Montreal navigation on the St. Lawrence River is provided by isolated channel improvements and a series of lateral canals built around the rapids, also constructed and operated by the Government of Canada; these improvements afford a depth of 14 feet of water.

Navigation from Montreal to the sea is provided with channels dredged to a depth of 30 feet and having a minimum width of 450 feet in the straight sections and a maximum width of 600 to 750 feet at the bends. A project, begun in 1909 and now half completed, will provide a channel with a minimum depth of 35 feet.

On the Great Lakes and the St. Lawrence River

navigation was classified in 1926 by the Joint Board of Engineers into three divisions:-¹

1. Lake navigation, operating normally on a 20-foot draft, on and between all the lakes with the exception of Lake Ontario.

2. Canal navigation operating normally on a 14-foot draft between the ports of Lake Erie and the port of Montreal through the Welland Canal, Lake Ontario, the St. Lawrence River, and the St. Lawrence canals.

3. Deep-sea navigation from the port of Montreal to the Atlantic Ocean.

The completion of the new Welland Ship Canal will open Lake Ontario to deep lake navigation. This canal is in the final stages of construction, and within a comparatively short time will be open for the passage of vessels. The only separating link between deep lake navigation and ocean navigation is the 183 miles of the St. Lawrence River above Montreal, which stretch will eventually be deepened to the desired depth.

The table, compiled from data obtained from United States War Department Bulletin No. 39, "Survey of Northern and Northwestern Lakes," shows the distances of

1. Report of Joint Board of Engineers on St. Lawrence Waterway project, November 16, 1926, p. 11 (69th Congress, 2nd Session, Senate Document No. 183).

*Table showing distances of open and restricted navigation, and canals between Duluth, Minn., and Liverpool, Eng., via the proposed St. Lawrence Waterway.
(Distances in Statute Miles)

FROM	Open Navigation Distance Miles	Improved Channel Distance Miles	Canals Length Miles	Total Distance Miles	L O C K S		
					No.	Length Feet	Width Feet
Duluth to St. Mary's River	383	----	----	383			
St. Mary's River and St. Mary's Falls Canal	28.1	33	1.9	63	1	1,300	80
St. Mary's River to St. Clair River	223			223			
St. Clair River	27	13		40			
Lake St. Clair	13.5		3.5	17			
Detroit River	22	9		31			
Detroit River to Welland Ship Canal	218			218			
Welland Ship Canal			25	25	7	820	80
Welland Ship Canal to foot of Lake Ontario	160			160			
St. Lawrence River to Montreal	117	19	a(46 b(20	182	6	740- 800	80
St. Lawrence: Montreal to Strait of Belle-Isle	986			986			
Belle-Isle to Liverpool, England	2,221			2,221			
Total Distances	4,407.6	74	c(76.4 d(50.4	d(4,558	14		
							25- 30

- a. Present restricted canals, with the improvement confined largely to the bed of river.
b. Reduced under the proposed deep waterway plan.
c. Canal distance reduced by 26 miles under plan.
d. 3963 nautical miles.

* Compiled from U. S. War Department, Corps of Engineers, "Survey of Northern and North-western Lakes." Bulletin No. 39, April, 1930.

open and restricted navigation and canals on the St. Lawrence waterway.

The Joint Board of Engineers in 1926 estimated that the present lake commerce was upwards of 100 million tons per annum, the bulk cargoes of which were principally iron ore, coal, and grain. These commodities are moved in a special class of vessels developed for that purpose which are of great length in proportion to their draft, and so designed that they can be loaded and unloaded rapidly by special machinery installed at terminal ports for that purpose. Canal commerce through the Welland and St. Lawrence canals is carried in smaller vessels of similar design. These vessels are equipped with high-powered propulsion machinery to meet the swifter currents occurring on the St. Lawrence River. This commerce through canals has been increasing rapidly in recent years, that on the St. Lawrence River canals amounting in 1925 to 6,206,980 tons. Practically all of the grain reaching the port of Montreal in the past few years has been transported by way of this route.

During the last twenty years the average dates of opening and closing navigation on the Great Lakes,

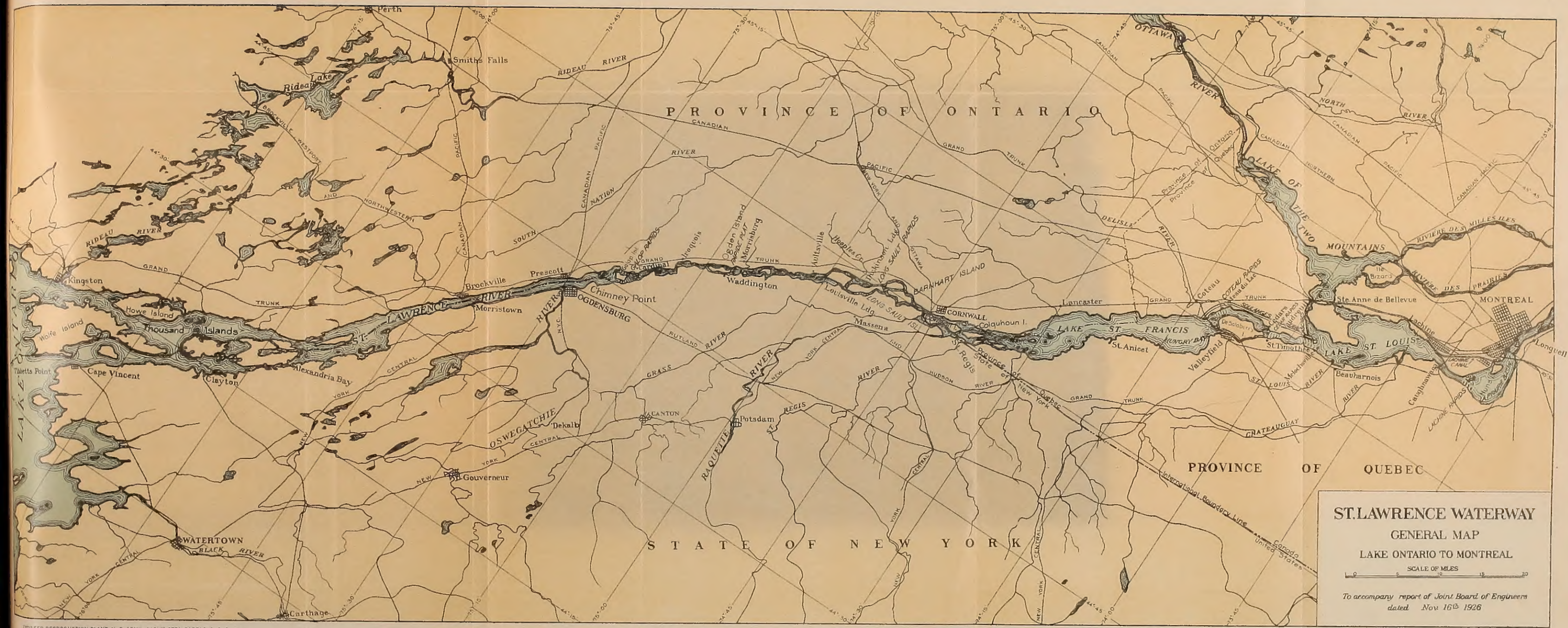
their inter-connecting chammels, and on the river St. Lawrence have been as follows:

Section	Opened	Closed
Great Lakes, including the connecting waterways at St. Mary's River and at the St. Clair and Detroit Rivers as far east as the Welland Canal	April 18	Dec. 19
Welland Canal	" 18	" 16
St. Lawrence River canals above Montreal	" 26	" 9

- - - - -

Average date of arrival of first vessel from sea into port of Montreal over a ten year period	April 28
Average date of last departure from that port ocean bound	Dec. 7

The St. Lawrence River project itself principally concerns only that part of the river that lies between the outlet from Lake Ontario and the port of Montreal, but it inevitably effects the entire inland navigation system and its completion will entail the deepening of all Great Lakes harbors and connecting-lake chammels, as well as provision for suitable terminal facilities and equipment. From the foot of Lake Ontario the St. Lawrence River runs in deep, slow-flowing reaches and lake-like expansions, easy to improve, with intervening sections of rapids and swift currents. For the first 67 miles down stream from Lake Ontario the river



is a deep and peaceful stream. Thence it passes through the remaining 49 miles of the river within the international boundary section in a succession of rapids and swift water. Leaving the international demarcation line the river expands into the placid waters of Lake St. Francis; from this lake the water falls in a series of rapids to Lake St. Louis, and thence drops through a succession of rapids to the harbor of Montreal. This portion of the river has been under consideration by international and national organizations for improvement since 1920.

Governmental Organizations

Many Canadian, American, and international commissions, engineering boards, and committees have energetically studied and reported on the feasibility and practicability of improving and deepening the St. Lawrence route to the seaboard. The work of four of these governmental investigating bodies requires special consideration in connection with the present project. These bodies are:

- a. International Joint Commission
- b. Joint Board of Engineers
- c. United States St. Lawrence Commission
- d. Canadian National Advisory Committee

At various times since the formation of the International Joint Commission by virtue of terms expressed

in Article 9 of the Treaty of January 11, 1909, between the Governments of United States and Great Britain, reports have been made upon this important project; their recommendations and summaries of conclusions are incorporated in the pages following.

International Joint Commission

The first investigation as to the means by which the St. Lawrence waterway project might be carried into effect was undertaken during the years 1920 and 1921 by the International Joint Commission,¹ a body created under terms of Article 9 of the Boundary Waters Treaty made on January 11, 1909, between Great Britain and the United States. This Commission was instructed by the Governments of Canada and the United States in 1920 to investigate and report on the feasibility of improving the waterway for deep draft vessels, firstly, for navigation interests alone, and secondly, for the combination of navigation and power interests.

1. Cf. Congressional Digest, January, 1927, p. 10.
"Article IX: The High Contracting Parties further agree that any other questions or matters of difference arising between them involving the rights, obligations or interests of either in relation to the other along the common frontier between the United States and the Dominion of Canada, shall be referred from time to time to the International Joint Commission for examination and report, whenever either the Government of the United States or the Government of the Dominion of Canada shall request that such questions or matters of difference be so referred."

The Commission consisted of six members, three from the United States and three from Canada, in addition to which each country was provided with one Secretary; the whole was as follows:-

UNITED STATES OF AMERICA:

Obadiah Gardner, Chairman
Clarence D. Clark
Marcus A. Smith
William H. Smith, Secretary

DOMINION OF CANADA:

Charles A. Magrath, Chairman
Henry A. Powell, K.C.
Sir William Hearst, K.C.M.G.
Lawrence J. Burpee, Secretary

At the same time both Governments created a Board of Engineers, consisting of one engineer from each country, who were directed to arrange the necessary surveys, plans, and estimates, and submit them to the Commission within a year. This Board of Engineers was made up of

W. A. Bowden,
Chief Engineer of the Department of Railways and Canals, Canada
Lieut. Colonel W. P. Wooten,
Corps of Engineers, United States Army

It was their findings which were used by the Commission as a basis for calculations of engineering and cost particulars in its report.¹

1. Cf. Report of the United States and Canadian Government Engineers on the Improvement of the St. Lawrence River from Montreal to Lake Ontario, made to the International Joint Commission. Senate Document No.179, 67th Congress, 2nd Session, 1922.

The International Joint Commission submitted its report on 19th December, 1921, and recommended that the improvement of the river be undertaken.

With reference to the economic aspect of the problem, and particularly with regard to the prospect of adequate traffic, the Commission's findings¹ read as follows:-

"As to the economic practicability of the waterway, the commission finds that, without considering the probability of new traffic created by the opening of a water route to the seaboard, there exists today, between the region economically tributary to the Great Lakes and overseas points as well as between the same region and the Atlantic and Pacific seabords, a volume of outbound and inbound trade that might reasonably be expected to seek this route sufficient to justify the expense involved in its improvement."²

1. As regards the matter of public opinion relative to the St. Lawrence Waterway project, the Commission's findings ("St. Lawrence Waterway," Sen. Doc. No. 114, p. 155) reads as follows:

"An analysis of the testimony makes it clear that the consensus of opinion in the two countries, as revealed at the public hearings, while far from unanimous, was on the whole distinctly favorable to the proposed improvement of the St. Lawrence. Broadly speaking, it may be said that public sentiment throughout the Middle Western and Western States, from Ohio to Idaho was almost unreservedly in favor of the deep waterway. The only evidence submitted on behalf of the people of the Mississippi Valley was also favorable. Various organizations and individuals in the Eastern States expressed themselves as approving of the project. On the other hand, evidence was not wanting of a widespread sentiment in some of the Eastern States antagonistic to the project. On the Canadian side, anything like general approval of the undertaking was confined to the Province of Ontario. In the other Provinces, public sentiment appeared to be either indifferent or more or less hostile."

2. Ibid., p. 176.

The estimated cost of the completed work between Montreal and Lake Ontario to provide a channel of 25 feet depth and to develop 1,464,000 h.p. was as follows:-¹

First division:	Side canal from Montreal harbor to deep water in Lake St. Louis	\$55,783,000
Second division:	Side canal from deep water in Lake St. Louis to deep water in Lake St. Francis	36,590,000
Third division:	Channel dredging in Lake St. Francis	1,158,000
Fourth division:	Combined navigation and power development in international section, with annual power output of 1,464,000 h.p. (total installed capacity approximately 1,850,000 h.p.) ..	159,097,200
Fifth division:	Navigation improvement above rapids section	100,000
		<u>\$252,728,200</u>

The cost of increasing the navigable depth throughout the entire stretch to 30 feet at a future date was estimated to be \$17,986,180.² The Commission considered plans for development of power in the first and second divisions but did not make any recommendations.

The particulars of the International Joint Commission recommendations were as follows:-³

1. Report of the United States and Canadian Government Engineers, Senate Document No. 179, 67th Congress, 2nd Session, 1922, pp. 4-6.

2. Ibid., p. 6.

3. "St. Lawrence Waterway," Senate Document No. 114, 67th Congress, 2nd Session, 1922, pp. 180-181.

"(1) That the Governments of the United States and Canada enter into an arrangement by way of treaty for a scheme of improvement of the St. Lawrence River between Montreal and Lake Ontario.

"(2) That the New Welland Ship Canal be embodied in said scheme and treated as a part thereof.

"(3) That the proposed works between Montreal and Lake Ontario be based upon the report of the engineering board accompanying this report, but that before any final decision is reached the report of the board, together with such comments, criticisms, and alternative plans as have been filed with the commission be referred back to the board enlarged by other leading members of the engineering profession, to the end that the whole question be given that further and complete study that its magnitude and importance demand, and that after completion the administrative features of the improvement be carried out as set forth in recommendations 7 and 8 hereof.

"(4) That there shall be an exhaustive investigation of the extent and character of the damage through flowage involved in the plan of development finally adopted.

"(5) That, assuming the adoption of the plans of the engineering board, or of other plans also involving a readjustment of the international boundary, appropriate steps be taken to transfer to one country or the other, as the case may be, the slight acreage of submerged land involved.

"(6) That Canada proceed with the works necessary for the completion of said New Welland Ship Canal in accordance with the plans already decided upon by that country.

"(7) That such 'navigation works' as do not lie wholly within one country or are not capable of economic and efficient construction, maintenance, and operation within one country as complete and independent units, be maintained and operated by a board hereinafter called 'the International Board', on which each country shall have equal representation.

"(8) That such 'navigation works' as lie wholly within one country and are capable of economic and

efficient construction, maintenance, and operation as complete and independent units be maintained and operated by the country in which they are located with the right of inspection by the said international board to insure economy and efficiency.

"(9) That 'power works' be built, installed, and operated by and at the expense of the country in which they are located.

"(10) That, except as set forth in recommendation (11), the cost of all 'navigation works' be apportioned between the two countries on the basis of the benefits each will receive from the new waterway: PROVIDED, That during the period ending five years after completion of the works - and to be known as the Construction Period - the ratio fixing the amount chargeable to each country shall be determined upon certain known factors, such as the developed resources and foreign and coastwise trade of each country within the territory economically tributary to the proposed waterway, and that that ratio shall be adjusted every five years thereafter and based upon the freight tonnage of each country actually using the waterway during the previous five-year period.

"(11) That the cost of 'navigation works' for the combined use of navigation and power over and above the cost of works necessary for navigation alone should be apportioned equally between the two countries."

The engineers from the United States and Canada connected with the Commission concurred in all the recommendations in the report with exception of the program for regulation of the levels and outflow from Lake Ontario which should be effected after completion of the project; each group outlined suggestions which they considered most suitable for the accomplishment of the purpose.

The Commission's report of 1921 was not followed by any official action; but in 1924 Canada and the United States each appointed an investigating body to report on those features of the proposition which had particular reference to their respective countries. The group appointed in the United States was known as the St. Lawrence Commission and had seven members, Mr. Herbert Hoover, then Secretary of Commerce, as Chairman. The Canadian group was called the National Advisory Committee; it consisted of nine members under the Chairmanship of the Honourable George Perry Graham,¹ Minister of Railways and Canals.

A Joint Board of Engineers was created about the same time having six members, three from each country being appointed to consider the engineers' report of 1921 and to take under advisement further questions put before them.

Joint Board of Engineers

The Joint Board of Engineers was constituted following the recommendation of the International Joint Commission in its report on the improvement of the St. Lawrence waterway in 1921. On April 2, 1924, the Government of the United States appointed as members of

1. Later succeeded by Walter E. Foster.

the United States section of the Board, and as advisers to the St. Lawrence Commission of the United States, the following officers from the Corps of Engineers:¹

Major General Edgar Jadwin, Chief of Engineers
Colonel William Kelley
Lieutenant Colonel George B. Pillsbury

The Canadian Government, on recommendation from the Privy Council approved by the Governor General on May 7, 1924, appointed the following, who were also to act as advisers to the Canadian National Advisory Committee, as members of the Canadian section of the Board:²

Mr. Duncan W. McLachlan, of the Department of
Railways and Canals, Ottawa
Mr. Olivier O. Lefebvre, Chief Engineer, Quebec
Streams Commission, of Montreal
Brigadier General Charles Hamilton Mitchell,
C.B., C.M.G., of Toronto

The Canadian and United States governments agreed in an exchange of notes on February 4 and March 17, 1925, that instructions to the Joint Board of Engineers be issued as given below:-³

"The Governments of Canada and the United States have accepted the recommendation made by the International Joint Commission in its report dated December 19, 1921, that the question of the development of the St. Lawrence River for navigation and for the supply

1. Report of Joint Board of Engineers, "St. Lawrence Waterway Project," 1927, Senate Document No. 183, 69th Congress, 2nd Session, p. 8.

2. Ibid., p. 8, and Canadian Order in Council P.C. 778.

3. Ibid., (Senate Document No. 183) pp. 8 and 9.

of power be referred to an enlarged joint board of engineers.

"It is desired that the new board should review the report dated June 24, 1921, made by the late Mr. W. A. Bowden and Col. W. P. Wooten, and that it should extend its inquiries to certain additional matters with a view to supplying the technical information likely to be relevant to the proposals made in the report of the International Joint Commission above referred to. The new board is therefore charged at this time with reporting upon the following:

"1. Is the scheme for the improvement of the St. Lawrence waterway, presented by the board in its report of June 24, 1921, practicable, and does it provide to the best advantage, at this time and ultimately, for the development of the capacities and possibilities of the waterway?

"2. What alternative scheme, if any, would be better adapted to secure the ends desired, due consideration being given -

"(a) To any special international or local interests having an importance justifying exceptional consideration; and

"(b) To the extent and character of the damage through flooding and the probable effect of the works upon the formation of ice and the consequent effect on the flow of the river?

"3. Should the estimates of cost be revised, and if so, what are the revised estimates of cost having regard to alternative schemes?

"4. In order to assist either Government to allocate the amounts chargeable to navigation and power, what would be the respective estimated costs for improving the river for navigation alone and for power alone?

"5. To what extent may water levels in the St. Lawrence River at and below Montreal, as well as the river and lake levels generally, be affected by the execution of the project?

"6.(a) To what extent and in what manner are the natural water levels in the St. Lawrence River and on the Lakes affected by diversions authorized by license by either Canada or the United States from or in the St. Lawrence River watershed?

"(b) By what measures could the water levels or navigable depths affected by the diversions referred to in section 6 (a) be restored, and what would be the cost thereof?

"(c) How much power could be developed on the St. Lawrence River with the water diverted from the watershed referred to in section 6 (a) under -

"(1) The plans recommended?

"(2) Alternative plans providing for a full practical development of the river?

"(d) Without considering compensation by the present relative diversions of water from the Niagara River and from Lake Erie, and without prejudice to a future consideration thereof, what works, if any, could be constructed to recover on the St. Lawrence River the amount of power determined under section 6 (c), and what would be the cost of such works?

"7. Having regard to economy of construction and maintenance, expedition of construction, and efficiency of operation -

"(a) Which of the works should be constructed under the technical supervision of an international board and what other works, if any, might advantageously be constructed under such supervision?

"(b) Which of the works should be maintained and operated by an international board and what other works, if any, might advantageously be so maintained and operated?

"8. What, if any, readjustments in the location of the international boundary are necessary or desirable to place power structures belonging to either country within its borders, as recommended by the International Joint Commission?

"9. If the board is of the opinion that it would be advantageous to provide in the first instance for channel depths other than 25 feet, but less than 30 feet, for what draft of vessel should provision be made?

"10. Having regard to the recommendation of the International Joint Commission that the new Welland Ship Canal should be embodied in the scheme and should be treated as a part thereof, and to the fact that if a greater depth than 21 feet be adopted for the initial project depth of the St. Lawrence, such greater depth would not be available to the upper lake parts without further work in the navigation channels in the Lakes, what would be the cost of improving the main navigation channels between and through the Lakes, so as to provide, without impairing the present lake levels for (a) a depth of 25 feet and (b) for such other depth not exceeding 30 feet as may be determined by the board to be that for which it would be most advantageous to provide on the St. Lawrence River?

"11. What is the time required to complete the proposed works, the order in which they should be proceeded with, and the progress which should be made yearly toward the completion of each in order to secure the greatest advantage from each of the works and from the development of the waterway as a whole?

"It is desired that the report be accompanied by such drawings as are necessary for showing the location and general character of the works proposed.

"It is also desired that in the preparation of the report due regard should be had to any diversions from or in the St. Lawrence River watershed which, at the date of the report, are authorized by license by either Canada or the United States.

"It is desired that the board report from time to time on the matters referred to it as the progress of its inquiries permits, and that these inquiries be so prosecuted that, if practicable, the board should have reported on all such matters by the end of April, 1926."

On November 16, 1926, the Board submitted its exhaustive report in which it divided the problem of the

St. Lawrence River from Lake Ontario to Montreal into five sections, as follows:¹

"1. The Thousand Islands section (fifth division of the report of 1921), embracing the deep, lake-like reaches of the river, 67 miles in length, from Lake Ontario to the first swift water at Chimney Point, 3 miles downstream from Ogdensburg, N. Y., and Prescott, Ontario.

"2. The International Rapids section (fourth division of the report of 1921), embracing the 48 miles of rapids and swift water between Chimney Point and the head of Lake St. Francis.

"3. The Lake St. Francis section (third division of the report of 1921), extending 26 miles through that lake to the end of deep water at its foot.

"4. The Soulanges section (second division of the report of 1921), embracing the 18 miles of rapids and shoal water from Lake St. Francis to Lake St. Louis.

"5. The Lachine section (first division of the report of 1921), embracing Lake St. Louis and the rapids and shoals from this lake to Montreal Harbor, a length of 23 miles."

The Thousand Islands and International Rapids sections lie along the international boundary between the State of New York and the Province of Ontario. The other three sections lie partly in the Province of Ontario and partly in the Province of Quebec. The improvement of the Thousand Islands section and the Lake St. Francis section is entirely a matter of excavating

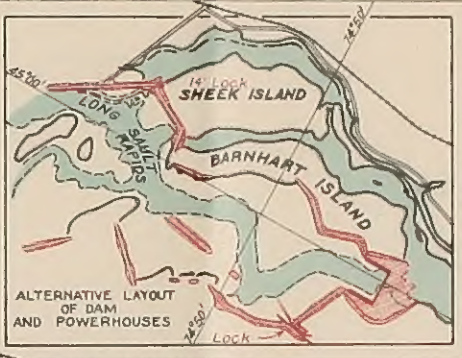
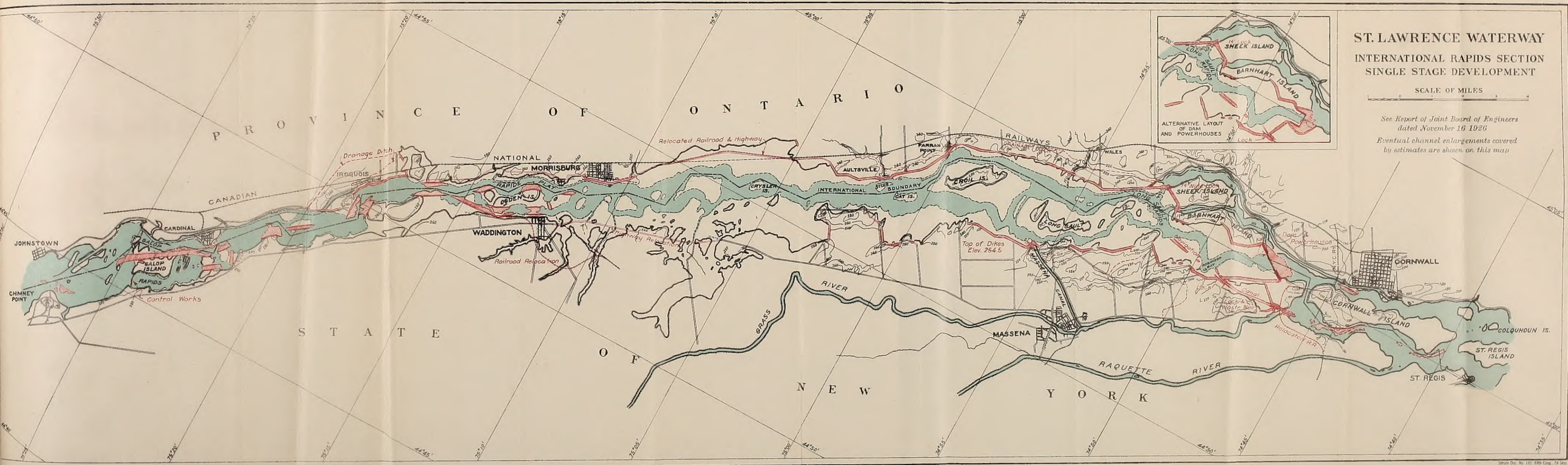
1. Report of Joint Board of Engineers "St. Lawrence Waterway Project," 1927, Senate Document No. 183, 69th Congress, 2nd Session, p. 8.

channels to a sufficient depth of water for proposed navigation purposes. The other three sections can also be improved to admit the utilization of potential power which can be developed in addition to the navigation improvements.

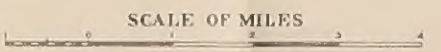
The Joint Board of Engineers prepared plans in accordance with the accepted principle that the interests of navigation on the St. Lawrence River are paramount. It was conceded by this body that a full observation of this principle would not interfere with the beneficial use of the flow of the river waters for power generation; on the contrary it was acknowledged that the improvement of the rapid sections of the St. Lawrence for the combined benefit of power and navigation would afford as a general rule much better navigation facilities than would be secured by the single improvement now economically justifiable in the interest of navigation alone.

In presenting its schemes the Joint Engineering Board kept in mind the desire to provide to the best possible advantage commensurate with its cost for the development and capacity of the waterway for present and future times. Their endeavor was to provide the maximum amount of open navigation with a minimum of

locks and canals. It adopted the minimum standards mentioned below for the initial improvement, but reservations were made in the plans to enable the enlargement of navigation improvements with the least possible economic loss whenever the volume of traffic justified. These were the standards recommended and adopted by the Board: channels for navigation to have a width of 450 feet, except in canal sections where they should have a bottom width of 200 feet at 25 foot depth; open channels should be widened where advisable on account of cross currents and at bends, and should both be widened and deepened as required to afford suitable current velocities for navigation; the locks to conform in dimensions with those built in the new Welland Ship Canal, and to have chambers 859 feet in length between the inner quoin posts and 766 feet between the breast wall and the fender; the clear width of the locks to be 80 feet, and the depth of water over the mitre sills to be 30 feet; duplicate sets of gates to be provided so that two gates can always be closed against the upper level; fenders to afford an additional safety precaution, and guard locks or emergency dams to be provided where necessary to afford a means for stopping the flow that would result from the accidental destruction of any lock gates. The plans are drawn so that



**ST. LAWRENCE WATERWAY
INTERNATIONAL RAPIDS SECTION
SINGLE STAGE DEVELOPMENT**



See Report of Joint Board of Engineers
dated November 16 1926
Eventual channel enlargements covered
by estimates are shown on this map



engineers holding for a two-stage plan (two pools and dams).

It was estimated that expenditures required to open navigation with 25 foot channels, with an initial power development having one-half the final installed capacity of the power house first constructed, the installation of the balance to be deferred until the growth of the market warrants, is as follows:¹

"(1a)	Total cost of improvement if with a single-stage development in the international rapids section (1,365,000 horsepower initially installed)	\$350,100,000
"(1b)	Above improvement before channels are enlarged to insure winter operation	337,100,000
"(2)	Total cost of improvement if with a two-stage development in the international rapids section (1,365,000 horsepower initially installed)	385,500,000
"(2b)	Above improvement if the initial power installation in the international rapids section is all made at the power (Barnhart Island) plants	361,600,000

"After all of the machinery in plants recommended by the board has been installed, these costs will become, respectively:

"(1)	If with a single-stage development of the international rapids section (2,730,000 installed horsepower)	394,000,000
"(2)	If with a two-stage development of the international rapids section (2,619,000 installed horsepower)	423,600,000"

1. Ibid., (Senate Doc. No. 183), p. 47.

The Board considered it advisable to present alternative plans and estimates in several instances, for the reason that a choice between them rests on broad questions of policy rather than upon strictly engineering considerations. Therefore, it was determined that the estimated cost of additional channel excavation required to provide a 27-foot depth of water from Lake Ontario to Montreal instead of a 25-foot depth would be \$5,800,000. On the other hand, it was considered that an estimated saving of about \$5,350,000 would be realized by providing channels at first 23 feet deep instead of 25 feet deep. Subsequent dredging to provide 30 feet depth of channels initially excavated to 25 feet would cost approximately \$24,400,000.

They further estimated that the cost of additional works required to complete the maximum practicable development of power in the river with works having an installed capacity of \$2,500,000 h.p., would be about \$225,000,000. The total eventual power installation is approximately 5,000,000 h.p., and the total eventual cost of obtaining this power and to provide navigation with 25 feet depth of channels, is figured at from \$620,000,000 to \$650,000,000, depending, of course, on the form of improvement finally

accepted for the International Rapids section.

The Joint Board did not include any estimates as to the cost of improvement of lake harbors or harbor approaches. They pointed out regarding Montreal that the channel below that city had already been improved to a 30-foot depth, and that enlargements to a 35-foot depth at that time were under way.

This report was submitted to the President with the report of the United States St. Lawrence Commission by Mr. Herbert Hoover, Chairman of the Commission.

United States St. Lawrence Commission

The United States St. Lawrence Commission, a national committee of nine members, was appointed by President Coolidge on March 14, 1924, to act as an advisory committee to the Federal Government on all questions that thereafter might come up in the consideration of the St. Lawrence River.

The personnel of the Commission comprises the men whose names appear below:

Hon. Herbert Hoover, Chairman
Stephen B. Davis, Counsel
Charles P. Craig, Executive Secretary
William C. Breed, New York
James P. Goodrich, Indiana
James E. Davidson, Michigan
Charles L. Allen, Massachusetts
James R. Howard, Iowa
James P. Noonan, Missouri

On December 27, 1926, Mr. Hoover (then Secretary of Commerce) submitted the report¹ of the Commission to President Coolidge accompanied by the report of the Joint Board of Engineers of Canada and the United States on the proposed project; these two reports the President transmitted on January 3, 1927, to the Congress for their information and consideration.

The Commission, after an exhaustive study of much available data accumulated since the formation of the International Joint Commission, determined upon certain conclusions,² which are briefly summarized as follows:-

1. The construction of a deeper waterway in the St. Lawrence to permit deep draft ocean vessels access to the Great Lakes would lessen the economic handicaps of adverse transportation costs, now prevailing, to a vast area in the interior of the continent, in which more than 40,000,000 inhabitants strive for a livelihood from its basic industries. This area has always suffered in its export and import traffic due to the natural transportation disadvantages, which, since the building of the Panama Canal, have been greatly aggravated;

1. Report printed as Senate Document No. 183, 69th Congress, 2nd Session (1927).

2. Ibid., pp. 1-6.

there can be no disagreement as to the benefits which would inevitably flow to this area if ship access to the Atlantic Ocean be afforded.

2. Several alternative routes have been put forward for a shipway other than by the St. Lawrence:

a. By reconstructing the present canal now connecting Lake Ontario with the Hudson River, making use of the new Welland Ship Canal then under construction by the Government of Canada to connect Lakes Ontario and Erie; and

b. By developing an "all-American" route, by using the proposed reconstruction of Lake Ontario-Hudson River canal system and by building a new ship canal to the south of Niagara Falls which would duplicate the new Welland Ship Canal.

3. By building all permanent structures with a depth of 30 feet, canals could now be made with depth that would permit vessels of 25 feet draft. Such canals would admit 88 per cent of all vessels now entering the American ports. The capacity of such a shipway, with a chain of single locks, is estimated at 30,000,000 tons per annum. It could be enlarged by the construction of additional locks paralleling those first installed whenever traffic demands warrant such further accommodation.

4. The United States Department of Commerce estimates that the annual tonnage available for transportation by the St. Lawrence route would be somewhere between 21 and 25 million tons.

5. That according to the United States engineers' report of December 6, 1926, the estimated cost of constructing the Lake Ontario-Hudson River route would be \$506,000,000; while for the "All American" route the estimated cost would be \$631,000,000. The net cost to the joint governments of the proposed project for the improvement of the St. Lawrence would be very much less; the language used by the Commission on this point was as follows:-

"The net cost to the joint governments of the improvement of the St. Lawrence route upon procedure indicated below would be upon the joint engineers' estimates of between \$123,000,000 and \$148,000,000, from which some further reductions should be made from further realization upon hydroelectric power."

6. The development of hydroelectric power in the upper rapids along the international section will eventually create a deeper shipway on the St. Lawrence route even if other routes are undertaken.

7. The eventual development of power in the international section will carry the shipway, with the comparatively minor expenditure of \$3,000,000, downstream a total of 141 miles out of the total of 183 miles of river between Lake Ontario and Montreal, or take it 42 miles distant from tidewater.

8. Two suggestions are made for the improvement of the last 42-mile stretch:

a. "Construction of a shipway could either be undertaken around these rapids independently of power development, or,

b. "By adopting plans which would give some 400,000 immediate horsepower and will provide important preparation for further installment of 2,350,000 horsepower later on."

It is estimated that the first alternative would cost about \$97,500,000, and the second would cost about \$161,000,000.

9. The undertaking of the project must be a joint one between the Governments of Canada and the United States.

10. The maintenance plus interest at $4\frac{1}{2}$ per cent on the St. Lawrence improvement would be "say \$10,000,000 after deduction of power returns from power actually developed as above." This charge would amount to 43 cents per ton of the "estimated annual medial tonnages."

11. Comparison of lockages and distances by the various proposed routes shows that actual distance from ports of the Great Lakes to northern European points via the St. Lawrence route would be less by 625 miles than by the Lake Ontario-Hudson River route; but from Great Lake ports to New York the distance would be, via St. Lawrence route, 1,550 miles greater.

12. Ten years is assumed as the minimum period for completion of the project.

13. The closeness of many points of all routes to the international border is considered to create the possibility of destruction in case of war.

14. This section takes cognizance of the special interest of New York State and the Federal Government in the development of power in the international section.

15. Any diversion of traffic from the railroads and eastern ports to the St. Lawrence route will more than be met by the natural growth in population and traffic before the completion of the project. The benefits are explicitly stated in the following language:

"In the wider view, the increased prosperity of the mid continent, the relief of many of their present economic difficulties, and development of huge water power for stimulation of industry and commerce in New York and New England shall add to the prosperity of the country as a whole and thereby benefit every citizen and every city."¹

The St. Lawrence Commission summarized its conclusions² in the following manner:

"First. The construction of the shipway from the Great Lakes to the sea is imperative both for the

1. "St. Lawrence Waterway Project," Senate Document No. 183, 69th Congress, 2nd Session, p. 6.

2. Ibid., loc. cit.

relief and for the future development of a vast area in the interior of the continent.

"Second. The shipway should be constructed on the St. Lawrence route, provided suitable agreement can be made for its joint undertaking with the Dominion of Canada.

"Third. That the development of the power resources of the St. Lawrence should be undertaken by appropriate agencies.

"Fourth. That negotiations should be entered into with Canada in an endeavor to arrive at agreement upon all these subjects. In such negotiations the United States should recognize the proper relations of New York to the power development in the International Section."

In no one of the above estimates was any provision made for interest on the invested capital during the period of construction.

Canadian National Advisory Committee

The National Advisory Committee¹ was appointed by the Canadian Government by Order in Council P.C. 779 of May 7, 1924, and consisted of nine members; the Committee was to act in an advisory capacity to the Dominion Government on all questions relative to the proposed St. Lawrence waterway. Its personnel was as follows:-

1. Cf. Canadian Sessional Papers, Vol. LX, No. 7, (1924), 14th Parliament, 3rd Session. (Sessional Paper No. 101f, p. 97). Order in Council P.C. 779 creating the National Advisory Committee of Canada.

Chairman, Hon. George Perry Graham,^a
Minister of Railways and Canals;
Dr. Wilfrid Laurier McDougall,
Chairman of the Montreal Harbor Commission;
Beaudry Lehman,
General Manager, Bank of Hoshelaga;
Hon. Adelard Turgeon,
Speaker of the Legislative Council of Quebec;
Hon. Sir Clifton Sifton, K.C.,
Late Chairman of the Canadian Conservation Commission;
Hon. Walter Edward Foster,
Former Premier and President of the Council of the
Province of New Brunswick;
Edward D. Martin, of Winnipeg;
Major General John W. Stewart,
of Vancouver;
Thomas Ahearn, of Ottawa.

a. Hon. Graham subsequently resigned the Chairmanship and was succeeded by Walter E. Foster, of New Brunswick.

The report¹ of the Committee was submitted to the Prime Minister of Canada, the Right Honorable W. L. Mckenzie King, on January 11, 1928. It consisted of a majority report with a partially concurring and partially dissenting minority report filed by two Committee members.

The majority report submitted by Hon. Walter E. Foster, the Chairman, is reproduced below:²

1. Cf. the Committee's letter, dated January 11, 1928, addressed to the Right Honourable W. L. Mackenzie King, Prime Minister of Canada, Ottawa, Ontario.

2. Report of the Canadian National Advisory Committee, January, 1928. (Reprinted in a Monograph entitled, "St. Lawrence Waterway Project: Method of Procedure Suggested by the Canadian National Advisory Committee." Published and circulated by the Canadian Deep Waterways and Power Association. 1928. 7pp.

"(1) We concur in the finding of the Joint Board of Engineers that the project is feasible, but we feel that, should the work be undertaken, proper allowance should be made for future requirements, and, inasmuch as the depth contemplated for the locks of the proposed scheme is 30 feet on the sills, we would recommend that the navigable depth of the reaches and connecting channels throughout should not be restricted to 25 feet, as contemplated by the engineering report. In the language of the report itself, we feel that any improvement of the St. Lawrence waterway should 'provide to the best advantage, at this time and ultimately, for the development of the capacities and possibilities of the waterway.' With this in mind, we have considered whether the depth should not be a uniform one of 30 feet, but, having regard to the statement in paragraph 111 of the report of the Joint Board of Engineers that the majority of the Canadian section favour initial excavation to a depth of 27 feet (accommodating vessels of 25-foot draft), we are of opinion that a depth of 27 feet should be sought. We are strengthened in that view by the recommendation of the United States St. Lawrence Commission of a 25-foot draft, which means a 27-foot navigation. This United States recommendation is based on the conclusions reached, after elaborate study by the United States Department of Commerce, to the effect that

'In order to assure proper ocean connection, the minimum depth of channels should be 27 feet, thus accommodating vessels of 25-foot draft; such draft would include 54 per cent of American cargo vessels and 88 per cent of all our entrances and clearances. It is felt that restricting operation to any less percentage of ocean-going vessels would materially detract from the usefulness of the proposed waterways.'

"An important consideration in this connection is the fact that it is much less costly to provide a proper depth at the outset of such an undertaking than to go over the work at a later date and deepen it.

"(2) We have stated our belief that the project is feasible; whether it is desirable at this time is a question that has engaged our earnest consideration. The Order in Council appointing us, in addition to directing attention to the technical aspects of the problem, referred as well to its economic, financial and

international phases. The economic aspects of the proposal were fully investigated by the International Joint Commission which went very exhaustively into the matter in 1921 and made a voluminous report in the course of which it was stated:

'As to the economic practicability of the waterway, the commission finds that, without considering the probability of new traffic created by the opening of a water route to the seaboard, there exists today, between the region economically tributary to the Great Lakes and overseas points as well as between the same region and the Atlantic and Pacific seabords, a volume of outbound and inbound trade that might reasonably be expected to seek this route sufficient to justify the expense involved in its improvement.

'It finds that, as between the American and Canadian sides of the tributary area, the former contributes very much the larger share of this foreign and coastwise trade, and in all probability will continue to do so for many years to come. The benefits to be derived from the opening of a water route to the sea will, therefore, accrue in much larger measure to American than to Canadian interests, though it is reasonable to assume that eventually the advantages may be more evenly distributed.'

"(3) We have carefully considered the financial aspects of the project. If it were seriously suggested that Canada should undertake to finance as a public undertaking the immense outlay that would be required even in the domestic section of the St. Lawrence, or assume one-half of the fresh financial obligations involved in the project as a whole, we would unhesitatingly recommend that no action be taken until such time as the Dominion shall have had opportunity to recover from the heavy financial burdens imposed by the war, by our railway obligations growing out of the war, and by the necessity, since the war ended, to find the large sums required for needed public works throughout the Dominion.

"(4) We are of opinion, however, that an arrangement might be made which would make possible the undertaking at little, if any, public expense, so far as Canada is concerned. The St. Lawrence, between

Montreal and Lake Ontario, consists of a national and an international section, and, with the exception of the Welland Canal, the international problem continues throughout to the head of the Lakes. We believe that the first concern of this Committee should be, and of the Government will be, the national aspects of the proposed undertaking, and we regard it as most desirable that the initial development take place in the purely domestic section of the river lying within the Province of Quebec. We believe that if a reasonable time were permitted in which to enable the resultant power to be economically absorbed the development of this national section would be undertaken by private agencies able and willing to finance the entire work, including the necessary canalization, in return for the right to develop the power.

"(5) The Committee considers that the international section presents features of greater complexity. Concerning it, the engineers are not agreed as to whether a single-stage scheme or a two-stage scheme is the better plan of development and we think it greatly in the public interest that a further attempt be made to reconcile the varying views expressed in the report of the Joint Board. We believe also that proposals which would oblige a number of thriving Canadian communities on the St. Lawrence to live behind embankments at a lower level than the waterway should be very carefully examined. Another feature that should be safeguarded, in the consideration of the method of development to be adopted, is the control of the fluctuations of flow from Lake Ontario, which must be assured unless the interests of the purely national section and of the port of Montreal are to be left in an unsatisfactory position. A scheme is now presented, in the appendices to the report, which involves consideration of an alternative location of the upper works of the Canadian two-stage plan. There are a number of reasons, therefore, that would seem to call for a further consideration of the purely engineering features of the international section, in which connection it may be advisable to ask the Ontario Government to nominate one or more engineers to cooperate with the United States and Dominion engineers in the making of a further study of the question.

"(6) The Committee has given careful thought to the financial side of the international situation.

Canada has been engaged for upwards of a hundred years in improving the navigation of the St. Lawrence River both above and below Montreal, and across the Niagara Peninsula. The Dominion has expended 30 millions on the ship channel that has made ocean navigation on a large scale possible to the port of Montreal. The proposed St. Lawrence project will benefit by that expenditure. The Dominion has spent fifty millions on canals and channel improvements between Montreal and Lake Erie, in which improved navigation United States shipping has had equal use and advantage. Canada has to date spent 87 millions on the Welland Ship Canal. Having regard to these vast expenditures on navigation works, certain of which, unlike United States works on the upper lakes, will be superseded by the proposed deepwater development of the St. Lawrence, we are of opinion that it would not be unreasonable to expect the United States to undertake the entire work, both for navigation and power, in the international section, and we are further of the opinion that even if the United States should do so the preponderance of outlay will have been with Canada. In support of this contention, the following figures are submitted, based on expenditures by both countries on the present through waterway, and on the estimated cost of the presently recommended scheme with 27-ft. navigation, a new American lock at Sault Ste. Marie of the same dimensions as proposed for the St. Lawrence shipway, and the development, on the St. Lawrence, of the power incidental to navigation:-

C A N A D A

"Present Works:

St. Lawrence ship channel	\$ 30,000,000
St. Lawrence and Welland canals	50,000,000
Lock at Sault Ste. Marie, Ontario	<u>5,560,000</u> \$ 85,560,000

"Proposed Works:

Welland Ship canal	115,600,000
National section, St. Lawrence shipway, 27-ft. navigation and development of 949,300 h.p.	<u>199,670,000</u> 315,270,000
Total for Canada	<u>\$400,830,000</u>

U N I T E D S T A T E S

"Present Works:

Dredging St. Clair and De-	
troit rivers	\$ 17,536,000
Locks at Sault Ste. Marie,	
Michigan	<u>26,300,000</u> \$ 43,836,000

"Proposed Works:

International section St.	
Lawrence shipway, 27-ft.	
navigation and initial	
development of 597,600	
h.p.	182,157,000
To complete development -	
additional power	
1,602,000 h.p.	92,090,000
Upper lake channels to 27-	
ft.	<u>65,100,000</u> <u>339,347,000</u>
Total for United States	<u>\$383,183,000</u>

"From the foregoing it will be seen that even if consideration be restricted to the work presently under discussion, the United States might, in view of the preponderance of benefit to be derived from the opening of the waterway, well assume the construction of the dams, canals and power development of the international section, as well as the work of deepening the channels and improving navigation to a depth of 27 feet from Lake Erie to Lake Superior. For the same reasons which convince us that the development of the national section of the St. Lawrence should be entirely domestic, we feel that the Welland Ship Canal should continue to retain its purely Canadian complexion and be completed to whatever depth may ultimately be agreed upon, at the expense of Canada.

"(7) As to the control and supervision of the works during construction, and operation and maintenance on completion, we are of opinion that all dams, embankments, power house substructures, water passages, gates and channel enlargements in the international section should be designed and constructed under the technical supervision of an international commission, which body might also be charged with full power, on completion, to supervise both maintenance and operation and to control and regulate the use of water at the power plants in the international section in order that such use

may be prevented from creating conditions harmful to navigation in any part of the St. Lawrence, and in order that the operation of the various power plants be conducted with proper regard to the use of water at power plants in the lower or national section of the river. We feel, however, that locks and other navigation structures lying entirely within one country or the other can, on completion, be most advantageously maintained and operated by the usual Government agencies in the two countries.

"(8) The Committee is cognizant of the fact that the plan of procedure herein outlined necessarily involves consideration of the problems of the province of Ontario from the standpoint of power supply during the interval between the development of the national section and of the international. We believe the situation justifies consideration of the present problem from the broad national standpoint by both the provinces concerned, and that in the national interests such arrangements should be made as will enable Ontario to secure her power requirements for eastern territory from the purely Canadian section of the river pending the development of the international reaches. We are of opinion that, in the light of the good understanding presently obtaining between the two provinces, this would not be difficult of arrangement, and that power could be thus secured at rates which will compare most favourably with present cost of Ontario power.

"(9) In consideration of the economic aspect, we have given some thought to the question of possible export of power. As to that we would say that we are in complete accord with the feeling throughout Canada that export of power should not be permitted.

"(10) We have considered whether the proposed waterway should be regulated and governed by treaties already in existence, or whether a new treaty should be negotiated, but feel that that is a matter which the Government would probably prefer to decide for itself. Therefore, we make no recommendation in that respect other than to express the conviction that in the event of a new treaty being negotiated, the United States should not be given any greater rights than obtain in existing treaties.

"In conclusion, we would suggest that early opportunity be taken to reply to the overtures to Canada which the United States has made in regard to the St. Lawrence project, and we are of opinion that Canada's reply should contain the general sense of the views herein expressed. We would add the suggestion that, in view of the delicacy of the international negotiations involved, it would be inadvisable that our report be made public until such time as, in the discretion of the Government, it might be published without prejudice to Canadian interests."

The Case For and Against the Proposed Project

There is considerable difference of opinion as to the amount of traffic available to use the St. Lawrence route if the improvements were made. Various individuals and organizations which have made a thorough study of the question estimate the potential volume at from 10,500,000 to 30,000,000 tons. There is general agreement, however, that the largest item to be transported is wheat and other grains, and the principal argument in favor of the project is that there would be tremendous savings in transportation costs on these commodities were the Great Lakes opened up to ocean traffic, the savings to accrue to the benefit of the farmer, who is now at a disadvantage in competition with other territories more favorably situated.

The question on which all considerations now hinge is formulated thusly: Would the type of vessel for which

accommodations are ultimately to be provided by the completion of the proposed project ever make use of them? In the great mass of conflicting testimony and opinion for and against the navigation and power project are a few important ones, which will help to make clear the respective positions of the various interests towards the undertaking and the completion of the proposed improvement.

The two proponents, favoring the project, whose conclusions will be included in this summary are:

- a. The International Joint Commission
- b. The United States St. Lawrence Commission

The two opponents, taking a firm stand against any attempt being made at extensive improvements, are:

- c. Engineers engaged by Montreal Board of Trade
- d. The Institute of Economics of Washington

Many other organizations have emphatically stated their opinions on the economic aspects of the proposed deep waterways both from a navigation and a power viewpoint, but a consideration of each individual expression upon this important subject is beyond the scope of this chapter.

a. The International Joint Commission

This Commission, as already set forth in the preceding pages, came into being under the terms expressed

in Article IX of the Treaty of January 11, 1909; it comprises three representatives from the Dominion of Canada and three from the United States of America, besides a secretary for each country. Their report was submitted to President Harding in January, 1922, and by him was referred to Congress for their information.

The Commission's conclusions are briefly summarized in a direct quotation hereunder:¹

"To sum up as briefly as possible its conclusions in the matter of the proposed improvement of the St. Lawrence River between Lake Ontario and Montreal, the commission finds nothing in the evidence to warrant the belief that ocean-going vessels of suitable draft could not safely navigate the waters in question as well as the entire waterway from the Gulf of St. Lawrence to the head of the Great Lakes, or that such vessels would hesitate to do so if cargoes were available.

"It finds that of the various alternative routes mentioned from the interior to the seaboard, none offers advantages comparable with those of the natural route by way of the St. Lawrence.

"As to the economic practicability of the waterway, the commission finds that, without considering the probability of new traffic created by the opening of a water route to the seaboard, there exists today, between the region economically tributary to the Great Lakes and overseas points as well as between the same region and the Atlantic and Pacific seabords, a volume of outbound and inbound trade that might reasonably be expected to seek this route sufficient to justify the expense involved in its improvement.

1. "St. Lawrence Waterway," Senate Document No. 114, pp. 176-178. (67th Congress, 2nd Session).

"It finds that, as between the American and Canadian sides of the tributary area, the former contributes very much the larger share of this foreign and coastwise trade, and in all probability will continue to do so for many years to come. The benefits to be derived from the opening of a water route to the sea will therefore accrue in much larger measure to American than to Canadian interests, though it is reasonable to assume that eventually the advantages may be more evenly distributed.

"It finds that the existing means of transportation between the tributary area in the United States and the seaboard are altogether inadequate, that the railroads have not kept pace with the needs of the country, but that this does not apply to the Canadian side of the area, where railway development is still in advance of population and production.

"While the commission is conscious of the fact that war conditions had something to do with the dislocation of railway traffic on the United States side of the boundary, and that various other factors must be taken into account, such as the congestion of traffic at certain critical points between the West and the Atlantic seaboard commonly referred to as 'bottle-necks,' and the abnormal demand for cars at certain times of the year to carry the peak load of the harvest, it is convinced that the fundamental difficulty lies rather in the phenomenal growth of population and industry throughout the middle western and western States, a growth which the railroads have failed to keep pace with.

"The solution of the problem, in the opinion of the commission, lies in the utilization of every practicable means of communication, and particularly of the wonderful natural waterway extending from the Atlantic into the very heart of the continent, together with the development of such a system of cooperation between railways and waterways as would at one and the same time bring the load the railways have to carry within practicable limits, and give the West an additional route for its foreign and coastwise trade.

.....
"The conclusion is obvious that, if countries that had for the most part to import their raw materials from abroad were able to build up a great foreign

trade because of their ready access to the sea, the region economically tributary to the Great Lakes, with its limitless resources, its raw materials within easy reach, its facilities for industrial expansion, can hardly fail to become an even greater factory in the world's markets than it is today, if given a practicable and efficient water route to the sea.

"Of scarcely less importance is the linking up of land and water routes. Here also the experience of Europe is illuminating. Belgium and England are the most densely populated portions of Europe, and both are preeminently industrial nations. Each possesses a network of railways reaching into every corner of the country, yet each is today, despite its very short rail haul to tidewater, finding it necessary, in order to give adequate service to congested areas, to link up the railways and the highways with the inland waterways. Despite the difference in area between these countries and the region tributary to the Great Lakes, transportation conditions are not altogether dissimilar, particularly in the more congested areas of the Middle West. One finds in such a district as that around the south shore of Lake Michigan much the same conditions of a rapidly increasing concentration of rail lines, that is so noticeable in England and Belgium. And similar conditions are quite evidently developing in the territory immediately tributary to Detroit, Cleveland, and other middle-western cities. When these cities and their tributary territory are given access to the sea, they will find it necessary, in order to secure the maximum benefits from the new route, to coordinate their railways and highways with the great waterway that will be common to them all. The advantages of cooperation will be found as real in this case as in Europe, although the remedy may be somewhat different in character.

"The whole question of the distribution of cost has given the commission some concern. If the area to be benefited were all in one country the problem of financing the improvement would be a comparatively simple one, but as the matter stands the situation is complicated not merely by the fact that two neighboring countries are joining in the project, but that these countries are unequal in population, unequal in wealth, unequal in their ability to make effective use of the waterway. That is the situation today, but

it does not necessarily follow that it will always be the situation. As the years go by the relative position of the two countries will doubtless change, and the disproportion between their population, wealth, and commerce may gradually diminish. In the meantime the fair and reasonable plan appears to be to divide the cost in proportion to the benefits each receives.

"Objection may be made that the proposed principle of dividing the cost in proportion to the benefits each country derives from the improvement could hardly be put into effect until the works had been completed and in operation for a sufficient period to secure reliable data on the subject. For the intervening period, however, the commission believes that there are already available authoritative statistics on which to base a tentative decision as to the interest each country is likely to have in the waterway.

"Another factor in the situation that should not be lost sight of is the peculiar relationship to the proposed improvement of the New Welland Ship Canal, a portion of which is now under construction. As pointed out in an earlier part of this report, the completion of the St. Lawrence improvement would remove the only barrier to the creation of a deep-water route from the head of the lakes to the sea. This would give at least 25-foot navigation from the sea up to the Detroit River, with a present minimum of about 20 feet above Lake Erie. Although entirely outside the strict terms of the reference submitted to it by the two Governments, the commission has been impressed by the fact that the New Welland Ship Canal is such an integral part of the waterway, and is so inseparably interwoven with the project under immediate consideration, that it should properly be considered as a part of the whole scheme and the expense of its construction should be apportioned between the two Governments upon the same basis as the works recommended for the upper St. Lawrence."

b. The United States St. Lawrence Commission

As previously mentioned, this Commission came into being on March 14, 1924, and comprises seven members, besides a counsel and executive secretary; Mr. Herbert

Hoover, then Secretary of Commerce, was the Chairman. Working in conjunction with the Commission was a joint board of engineers made up of three from the United States and three from Canada.

On December 27, 1926, the Commission submitted a report to President Coolidge in which various findings were outlined. These findings of fact are briefly summarized below, all based on a proposed channel of such a depth as would admit vessels of 25-foot draft:

1. A channel of this depth would admit 88% of all ships entering American ports.

2. Its capacity will be 30,000,000 tons per annum, which it is possible to increase to almost any reasonable amount by the construction of additional locks.

3. The Department of Commerce estimates the available tonnage at 21,000,000 to 25,000,000 tons per annum.

4. The proposed route via the St. Lawrence would cost, it is estimated, from \$123,000,000 to \$148,000,000. This would be for improvement of the St. Lawrence only, solely for navigation purposes.

5. If the potential power were developed completely it would give 5,000,000 h.p., one-half of which would be in Canada and the balance in the International Section.

6. The cost of maintaining the navigation part of the project would be \$10,000,000 per annum.

Having reported these findings, the Commission reached the following conclusion:

"The construction of the shipway from the Great Lakes to the sea is imperative both for the relief and for the future development of a vast area in the interior of the continent."

c. Montreal Engineers' Report

The Montreal Board of Trade had been conducting an exhaustive study in recent years on the proposed St. Lawrence waterway project. It desired further information and as a consequence requested two Canadian engineers, Messrs. Henry Holgate and J. A. Jamieson, to study "the question in all its bearings" and report the findings. The letter of request, dated August 8, 1929, addressed jointly to them by Mr. J. Stanley Cook, the Secretary of the Board of Trade, read as follows:

"The Council of this Board is desirous of obtaining authentic, unbiased information on the economic advantages of the proposed St. Lawrence Deep Waterway, both from a navigation and power viewpoint, and I am directed to ask you to study the question in all its bearings, and report the results of your study, setting forth such conclusions as you may reach and the facts on which they are based. The scope of your investigation and report should also include the International aspects of the problem.

"I may say that neither present nor past Councils have yet been able to reach a definite conclusion on this project, which constitutes one of the most important questions confronting the people of Canada.

The Council therefore hopes that your report will contain such complete and authentic data as to enable it to support or oppose the proposal in the full confidence that it is acting in the best interest of the Dominion as a whole."

Their report entitled "Report on the St. Lawrence Deep Waterway Project" was completed and submitted to the President and Council of the Montreal Board of Trade on September 13, 1929. Their findings of fact were briefly as outlined hereunder:

1. That the Canadian Government has already expended, up to the end of March, 1928, on the various projects now existing on the proposed route, including the old and new Welland Canals, lake channels, and St. Lawrence ship channel below Montreal Harbour, the vast sum of \$261,538,491. It will require approximately \$54,000,000 to complete the construction work now under way - a total expenditure of \$315,000,000.¹

2. That the probable combined (navigation and power) cost of the new 27-foot channel would be in the neighborhood of \$823,108,750, including interest at 5 per cent during a five-year construction period.²

3. That if the 27-foot navigation and power projects were carried out as separate enterprises, the

1. "Report on the St. Lawrence Waterway Project," made by Messrs. Holgate and Jamieson to the Montreal Board of Trade, 1929, p. 22.

2. Ibid., loc. cit.

combined expenditures would probably be \$900,397,500, also including interest during period of construction, subdivided as follows:¹

27-foot navigation channel	\$218,831,250
Power development-5,103,100 h.p.	681,566,250
Total estimated expenditure	<u>\$900,397,500</u>

4. That these estimates of cost do not include \$200,000,000, considered necessary for work above or in Lake Ontario.²

5. That the present canal system, combined with the Prescott terminal, will provide "ample facilities for all present demands, and also for a very great growth of traffic in future," and for reasons set out they can "see no sound argument in favor of the expenditure on a deep waterway below Prescott, as all economic features point devidedly against Canada entering on any such scheme," and, therefore, "it should not be undertaken."³

Having made these findings of fact, the engineers submitted to the Montreal Board of Trade the following three recommendations:⁴

1. "Report on the St. Lawrence Waterway Project," made by Messrs. Holgate and Jamieson to the Montreal Board of Trade, 1929, p. 22.

2. Ibid., p. 41.

3. Ibid., loc. cit.

4. Ibid., p. 46.

"1. That you use your influence to oppose the carrying out of the St. Lawrence Deep Waterway Project for the reasons given, it being an uneconomical proposition.

"2. That you urge on the Government the improvement of the existing canal system, to increase its efficiency up to the standard of the Soulanges and Lachine Canals.

"3. That you institute further enquiry into the economic situation of Montreal Harbour and the grain transfer system at Port Colborne, with a view to urging on the Government such improvements as will reduce charge on grain in transit to a figure which should reasonably be expected."

d. Report of Institute of Economics

The Institute of Economics of the Brookings Institution, at Washington, D.C., in accordance with provisions at the time of endowment by the Carnegie Corporation of New York is "conducted with the sole object of ascertaining the facts about current economic problems and of interpreting these facts for the people of the United States in the most simple and understandable form. The Institute shall be administered by its Trustees without regard to the special interests of any group in the body politic, whether political, social, or economic."

This Institute published an economic report on the St. Lawrence project in 1929. The report comprises a volume of 675 pages, and is entitled "The St. Lawrence Navigation and Power Project." Credit

for this contribution to the wealth of literature now available regarding the project must be attributed to its three authors: Harold G. Moulton (President of the Brookings Institution and Director of the Institute of Economics), Charles S. Morgan, and Adah L. Lee. According to Mr. Moulton's preface to the report credit is also given to certain gentlemen hereinafter named for their contributions: Edwin G. Nourse, Chief of the Agricultural Division of the Institute, who prepared the chapter on the relation of the proposed waterway to agricultural relief; Duncan A. MacGibbon of the University of Alberta, a Canadian authority on transportation, who collaborated on the Canadian aspects of the question. The engineering firm of Sanderson and Porter of New York contributed an extensive appendix (K) on the marketing of the United States share of the power to be developed in the international section of the St. Lawrence River.

The summary and conclusions set forth in Chapter XI of the report are condensed as follows:-¹

1. Costs. The combined cost as estimated for a navigation system with 27-foot depth of water and for

1. Cf. Harold G. Moulton, Charles S. Morgan, and Adah L. Lee, "The St. Lawrence Navigation and Power Project," Washington, D.C.: The Brookings Institution, 1929, Chapter XI, pp. 228-240.

the proposed power system would be \$999,000,000, subdivided in the following manner:

For navigation alone	\$614,000,000
For power	385,000,000

included in the total navigation cost is an item of \$159,000,000 for improvements in the St. Lawrence River; for navigation, power, and collateral improvements in lakes and channels the cost would be as follows:

"For Navigation

Improvements in St. Lawrence River	\$159,000,000	
Improvements in inter-connecting lake channels	90,000,000	
Improvements in lake harbor and port facilities*	250,000,000	
Welland Ship Canal (under construction by Canadian Government)	<u>115,000,000</u>	
Total		\$614,000,000

"For Power

Improvements in International Rapids section	\$301,000,000	
Improvements in Soulanges section	<u>84,000,000</u>	
Total		<u>385,000,000</u>

Combined Navigation and Power Costs	\$999,000,000
-------------------------------------	---------------

*This expenditure would of course incidentally benefit lake shipping."

According to preliminary estimates submitted by the Joint Board of Engineers there would be an additional cost of about \$225,000,000 for development of

the potential power which can be generated in the lower St. Lawrence, entirely within Canada.

2. Power. The hydroelectric power which would be generated by the scheme might be used in time to come, but its development at the present time is not warranted by the facts. The United States portion of the power could not be disposed of on the present market at a figure which would cover the cost of its production, as there has not yet been developed industry along the American side of the river sufficient to create a demand for it. The situation on the Canadian side is parallel, as there must necessarily be a tremendous industrial growth there before the power would find a market at a profitable price.

3. Shipping. A channel with 27 feet depth of water would limit the use of the St. Lawrence route to vessels of the type engaged in the coast-wise trade and to the smaller trans-oceanic freighters. First class cargo vessel service would not be established between lake ports and world markets, even if an adequate channel depth were provided, due to the fact that remunerative employment would be difficult to find for the vessels during the closed season.

4. Traffic. The total traffic over the projected route would probably not exceed 10,500,000 tons per annum. This includes through and local traffic except short hauls of sand and gravel. It is estimated that 60% of the tonnage would be in grain of which two-thirds would originate in Canada. The balance would be made up of such items as fertilizer, sugar, pig iron, petroleum, and coal.

5. Taxpayers' Burden. Figures have been computed to show that it would probably cost the taxpayers 11 cents per bushel to effect a saving of 4 cents in the cost of transporting grain.

6. "The conclusion is, therefore, inescapable that the proposed 27-foot navigation project cannot be justified on economic grounds. The inclusive costs - to taxpayers and shippers - are much greater than present transportation charges."

7. The situation in which the railroads of the United States find themselves today, in which they are equipped to handle a far greater volume of traffic than is available, is evidence of the fact that they will not prove inadequate for the needs during the next 10 years, and

8. Even if they did prove to be inadequate, the St. Lawrence waterway, because of its seasonal closing and

comparatively restricted carrying capacity, would not be the most satisfactory or most economical means of relieving the congestion.

9. The movement for waterway improvements is generally founded upon the conviction that water transportation is very much cheaper than rail transportation, but this belief is erroneous due to the fact that in modern times much of the burden of upkeep of waterways has been shifted from the boats using the waterway to the taxpayers.

Non-Governmental Organizations

Several organizations of semi-official character are deserving of particular mention on account of their activities and earnest endeavors to mould public opinion in favor of the St. Lawrence project. Recognition is accorded to three of the most important of these bodies.

Great Lakes-St. Lawrence Tidewater Association

This organization is, in the language of the association itself, "a voluntary association of twenty-three member States, associated to assemble and disseminate helpful information in regard to the improvement of the St. Lawrence to connect the Great Lakes with the ocean," associated by virtue of a legislative act, and, because

of its devotion to the interest of the public, supported solely and exclusively by government appropriations. The uniqueness of this organization is unparalleled and unprecedented, for no other of a like formation with a similar purpose for accomplishment has ever functioned in the history of the United States.

Twenty of these States have become members of the association by act of their respective Legislatures, which have also granted appropriations for meeting the common expenses. These States are:

California	Michigan	Oregon
Colorado	Minnesota	South Carolina
Idaho	Missouri	South Dakota
Illinois	Montana	Washington
Indiana	Nebraska	Wisconsin
Iowa	North Dakota	Wyoming
Kansas	Ohio	

The remaining three State members have become associated with the organization by executive act of their respective governors. These three States are:

Kentucky
Utah
West Virginia

Historical Review of Achievements of the Association: When Charles P. Craig, the present Vice-President-at-Large and Executive Director of the Great Lakes-St. Lawrence Tidewater Association addressed a large civic dinner gathering in the city of Duluth in January,

1919, he set in motion the movement which has resulted in much diplomatic negotiation between the United States and Canada for connecting the Great Lakes with the Atlantic Ocean by a deep draft waterway system which would permit an uninterrupted movement of ocean-borne commerce via the St. Lawrence River route.

Mr. Craig immediately followed up the address by calling upon the governors of the several border Lake States to obtain their approval and authorization for delegates representing their respective States to be present at an organization meeting that was to be held in February of the same year in the city of Washington. Six States responded to his suggestion and this meeting saw the birth of a formal organization which has since grown from six to twenty-three member States. Without any apparent causal connection with this organization meeting, there was originated through I. L. Lenroot, who at that time was United States Senator from Wisconsin, the amendment to the rivers and harbors bill, providing for a joint engineering board to make a study of the engineering features, and also a reference of the economic aspects of the St. Lawrence waterway project to the International Joint Commission, a tribunal permanently existing by virtue of Article IX of the Treaty

of January 11, 1909, consummated between the United States of America and Great Britain concerning the respective rights of the United States and Canada in the waters of the St. Lawrence River. This amendment to the rivers and harbors bill was in turn followed by several extended conferences in the Dominion of Canada leading to their concurrence in such references, and their participation in the establishment of a Joint Board of Engineers.

The Association held its first meeting for discussion and adoption of a program in Chicago, April, 1919. A gradual expansion since that date has taken place in the Council of States until today it comprises twenty-three sovereign States as enumerated above.

Declaration of Principles: Since the day of the first meeting of the Great Lakes-St. Lawrence Tidewater Association in Chicago it has persistently functioned as a voluntary association for the avowedly single purpose as set forth in the declaration of principles that were adopted at its organization meeting.

"The general purpose of this association shall be to bring the Atlantic to the heart of the continent through connecting the heart of the Great Lakes

with tidewater, via the St. Lawrence River, and for such purpose cooperate with the Dominion of Canada in what the Dominion is now so unselfishly engaged in doing to that end, and to secure like cooperation with the Dominion and her navigation and power interests in the further development of the St. Lawrence River and the rivers connecting the Great Lakes to a depth sufficient to accommodate ocean-going vessels of at least 30-foot draft, and also the development and utilization of the possible potential power development of these international waters in connection therewith and to use all lawful and proper means within the power of this association to - and in the shortest possible time - accomplish the purposes stated."

The Members of the Executive Committee are:

Hon. Henry J. Allen	. . . . .	Kansas
Hon. James P. Goodrich	. . . . .	Indiana
Hon. John Hammill	. . . . .	Iowa
Hon. George F. Shafer	. . . . .	North Dakota
Hon. Arthur J. Weaver	. . . . .	Nebraska
William George Bruce	. . . . .	Wisconsin
George E. Hardy	. . . . .	Ohio
Leo C. Harmon	. . . . .	Michigan
A. O. Morceaux	. . . . .	Minnesota
Col. Wm. Nelson Pelouze	. . . . .	Illinois

The Officers of the Association are:

Hon. Henry J. Allen,	President	Wichita
John A. Doelle,	Secretary	Lansing
R. J. Maclean,	Treasurer	Detroit
Charles P. Craig,	Vice-President-	
	at-Large, and	
	Executive Di-	
	rector	Washington

The Council of States is composed of a committee of representatives from each of the twenty-three sovereign States that form the voluntary organization of the Association. Each State delegation is headed by the chief executive of the State.

The Canadian Deep Waterways and Power Association

Under the auspices of the Border Cities Chamber of Commerce a large gathering took place in November, 1919, at Windsor, Ontario, and it was there that the Canadian Deep Waterways and Power Association was originally formed, with Mr. O. E. Fleming, K.C., of Windsor, as the President, and Major Alex. C. Lewis, of Toronto, as Secretary-Treasurer. This Association held its first annual meeting in December, 1920, at Toronto. Besides publishing much literature in support of the St. Lawrence Waterway project, it has co-operated with the American Association (Great Lakes-St. Lawrence Tidewater Association).

The Association was very active in advising with the Canadian Minister of the Interior during the period prior to the year 1925 when the formation of the Canadian National Advisory Committee on the St. Lawrence Waterway project was under consideration, which committee was appointed on May 7, 1924, to advise the Canadian Government. During 1925 the Association confined its activities to the assemblage and dissemination of helpful information from time to time respecting the proposed undertaking, and as to the possibilities for a reduction in freight rates which would

undoubtedly follow from the enlargement of the canals comprised in the St. Lawrence system.

It also lent its aggressive support to the public opposition to the diversion of an excessive amount of water from the Great Lakes through the Chicago Drainage Canal by the Commission having charge of the Chicago Sanitary District.

Officers of the Association

W. M. German, K.C.	Hon. President
Hon. Dr. R. J. Maion, M.P.	Hon. Vice-President
T. L. Church, M.P.	Hon. Vice-President
F. Maclure Sclanders, F.R.G.S.	Hon. Sec'y-Treasurer
O. E. Fleming, K.C.	President
T. W. Jutten	Vice-President
E. L. Cousins, C.E.	Vice-President for Ontario
Major Alex. C. Lewis	Secretary-Treasurer

Source: The Canadian Annual Review of Public Affairs, 1925 - 1926, page 116. By Right Hon. Sir George Foster, G.C.M.G.

Joint New England-St. Lawrence Waterway Committee

Purpose of the Committee: The Joint New England St. Lawrence Waterway Committee is an affiliation of six separate committees whose membership is made up of representatives of each of the six New England States. This committee came into being in November of the year 1923. Its purpose was to conduct a comprehensive study as to the feasibility and desirability of the projected development of the St. Lawrence River to a depth sufficient for navigation of deep draft

cargo vessels from the Great Lakes to the sea, and also to render an unbiased and impartial opinion with respect to the incompatibility of various conflicting claims and arguments occasionally advanced concerning the practicability of the project.

In its recent report on the proposed project the committee strongly recommended that the American Government seek early negotiations with the proper officials of the Canadian Government looking to the formulation of a treaty which will permit the joint undertaking of the enterprise.

Present Status of the St. Lawrence Project

The President, Mr. Herbert Hoover, made the following statement in his annual message to Congress in December, 1929:

"We are awaiting the action of Canada upon the St. Lawrence waterway project."

At the time Mr. Hanford McNider, the American Minister to Canada was sent to Ottawa, in August, 1930, he carried with him instructions to ascertain if possible the attitude of the Dominion Government toward undertaking and completing the project.¹ Acting upon

1. New York Herald-Tribune, September 16, 1930, p. 11.

these directions he forwarded the following communication to Premier Bennett:

"September 2, 1930

"The Honorable R. B. Bennett,
"Prime Minister and Secretary of
State for External Affairs,
"Ottawa.

"Sir:

"I have the honor to refer to previous correspondence exchanged between the government of Canada and the government of the United States on the subject of the proposed St. Lawrence Seaway.

"In pursuance of instructions from the President, I desire to state that the government of the United States stands ready to proceed with this proposed development at the earliest possible date. I have been directed to inquire whether the Canadian government now finds itself in a position to appoint commissioners to discuss jointly with commissioners of the United States the details of the seaway, and to formulate a treaty appropriate to the purpose.

"Accept, sir, the renewed assurances of my highest consideration.

"HANFORD MacNIDER."

Without holding the answer in abeyance for any great length of time Premier Bennett addressed the following letter to the United States representative:

"Ottawa, September 10, 1930

"The Hon. Hanford MacNider,
"Minister of the United States of
America, Ottawa:

"Sir - I have the honor to acknowledge your note of September 2, indicating the readiness of the government of the United States to proceed with the development of the proposed St. Lawrence waterway at an early date.

"The Canadian government has given consideration to some phases of the St. Lawrence waterway question, but in view of the fact that the Parliament of Canada is now in session and that the opening of the imperial conference has been set for September 30, it will not be possible to deal with the question in a comprehensive manner at the present moment. I purpose, however, to go into the matter immediately upon my return from the conference in November, and following this examination I shall communicate with you further.

"Accept, sir, the renewed assurances of my highest consideration.

"R. B. BENNETT.

"Secretary of State for External Affairs."

Up to the present date (April, 1931) no agreement has been reached between the two governments whereby they jointly undertake the development of power and navigation within the international section; but it must be admitted that Canada is still constructing navigation facilities within her own territory with the end in view of obtaining a through deep waterway to the Atlantic Ocean.

APPENDIX A

CORRESPONDENCE BETWEEN THE UNITED STATES GOVERNMENT
AND THE GOVERNMENT OF CANADA

I, Letter from the Secretary of State of the
United States, Washington, to the Am-
bassador of Great Britain,
Washington

DEPARTMENT OF STATE

Washington, D.C., May 17, 1923.

No. -

REFERENCE. - On January 21, 1923, the Govern-
ment of the United States and Canada referred to the
International Joint Commission for Investigation and
report under the 18 of the Treaty of
January 11, 1908, certain
questions with respect to the improvement of the St.
Lawrence river between Lake Ontario and Montreal for
navigation and for the development of water power. The
Commission made a report bearing date of December 19,
1921. For convenience I may call attention to the fol-
lowing recommendations which the Commission submitted
after setting forth the results of its investigation:

In harmony with the conclusions so outlined
in the foregoing report the Commission recommended:

(1) That the Governments of the United States
and Canada enter into an arrangement by way of
treaty for a scheme of improvement of the St. Law-
rence river between Montreal and Lake Ontario.

(2) That the new railroad ship canal be sub-
mitted in said scheme and treated as a part thereof.

(3) That the proposed works between Montreal
and Lake Ontario be based upon the report of the
Commission and upon the report of the
Commission which accompanied this report, but
that before any final decision is reached the re-
port of the Board, together with such comments,
criticisms, and alternative plans as have been
filed with the Commission be referred back to

APPENDIX A

CORRESPONDENCE BETWEEN THE UNITED STATES GOVERNMENT AND THE GOVERNMENT OF CANADA

- I. Letter from the Secretary of State of the
United States, Washington, to the Am-
bassador of Great Britain,
Washington

DEPARTMENT OF STATE

Washington, D.C., May 17, 1922.

No. -

EXCELLENCY, - On January 21, 1920, the Govern-
ments of the United States and Canada referred to the
International Joint Commission for investigation and
report under the terms of Article IX of the Treaty of
January 11, 1909, relating to boundary waters, certain
questions with respect to the improvement of the St.
Lawrence river between lake Ontario and Montreal for
navigation and for the development of water power. The
Commission made a report bearing date of December 19,
1921. For convenience I may call attention to the fol-
lowing recommendations which the Commission submitted
after setting forth the results of its investigation:-

In harmony with its conclusions as outlined
in the foregoing report the commission recommends:

(1) That the Governments of the United States
and Canada enter into an arrangement by way of
treaty for a scheme of improvement of the St. Law-
rence river between Montreal and lake Ontario.

(2) That the new Welland ship canal be embo-
died in said scheme and treated as a part thereof.

(3) That the proposed works between Montreal
and lake Ontario be based upon the report of the
engineering board accompanying this report, but
that before any final decision is reached the re-
port of the board, together with such comments,
criticisms, and alternative plans as have been
filed with the commission be referred back to

the board enlarged by other leading members of the engineering profession, to the end that the whole question be given that further and complete study that its magnitude and importance demand, and that after completion the administrative features of the improvement be carried out as set forth in recommendations 7 and 8 hereof.

(4) That there shall be an exhaustive investigation of the extent and character of the damage through flowage involved in the plan of development finally adopted.

(5) That, assuming the adoption of the plans of the engineering board, or of other plans also involving a readjustment of the international boundary, in order to bring each of the power houses on its own side of the boundary, appropriate steps be taken to transfer to one country or the other, as the case may be, the slight acreage of submerged land involved.

(6) That Canada proceed with the works necessary for the completion of said New Welland ship canal in accordance with the plans already decided upon by that country.

(7) That such "navigation works" as do not lie wholly within one country or are not capable of economic and efficient construction, maintenance, and operation within one country as complete and independent units, be maintained and operated by a board hereinafter called "the International Board," on which each country shall have equal representation.

(8) That such "navigation works" as lie wholly within one country and are capable of economic and efficient construction, maintenance, and operation as complete and independent units be maintained and operated by the country in which they are located with the right of inspection by the said international board to insure economy and efficiency.

(9) That "power works" be built, installed,

and operated by and at the expense of the country in which they are located.

(10) That, except as set forth in recommendation (11), the cost of all 'navigation works' be apportioned between the two countries on the basis of the benefits each will receive from the new waterway: Provided, That during the period ending five years after completion of the works and to be known as the Construction Period - the ratio fixing the amount chargeable to each country shall be determined upon certain known factors, such as the developed resources and foreign and coastwise trade of each country within the territory economically tributary to the proposed waterway, and that that ratio shall be adjusted every five years thereafter and based upon the freight tonnage of each country actually using the waterway during the previous five-year period.

(11) That the cost of 'navigation works' for the combined use of navigation and power over and above the cost of works necessary for navigation alone should be apportioned equally between the two countries.

It will be observed that the Commission recommends that an arrangement be entered into by way of a treaty for a scheme of improvement of the St. Lawrence river between Montreal and lake Ontario, and that the works contemplated by such arrangement be based upon the report of the Board of Engineers which accompanied the report of the Commission.

The Board of Engineers submitted specific recommendations with regard to the improvement of navigation and the development of water power. The board's recommendations and discussions deal with the project in five divisions and comprehend details of construction and estimates of costs thereof. The Board limited itself to the specific investigation entrusted to it with regard to a survey of the St. Lawrence river from Montreal to lake Ontario. The International Joint Commission has recommended that the New Welland ship canal be embodied in and made a part of the project under consideration.

The report of the Joint Commission and the accompanying report of the Board of Engineers have doubtless

by this time been considered by the Canadian Government. I am authorized by the President to state that he favours the negotiation of a treaty to be framed on the basis of the report of the Joint Commission, or such modifications as might be agreed upon, and I should be glad to be informed whether the appropriate British and Canadian authorities are disposed to undertake the negotiation of such a treaty.

Obviously much study would be required to frame a comprehensive agreement to govern the joint operations of the Governments of the United States and Canada with respect to the execution and the financing of the proposed work. Appropriate preliminary studies and investigations could probably be carried on by a joint commission of experts designated by the two Governments and charged with the framing of a projet of a treaty. I venture further to suggest that, if it should not be deemed desirable to formulate in the first instance a treaty embracing a complete plan for the execution and the financing of the project, it might be practicable to conclude a treaty, pledging the two Governments to undertake the execution of the project on the basis of the recommendations submitted by the International Joint Commission, or such modifications as may be agreed upon, and making provision for a joint commission charged with the duty of formulating such a complete plan, which should be subject to the approval of the two Governments prior to the beginning of the work of construction.

I should be glad if you would take the necessary steps to obtain and communicate to me the views of the appropriate British or Canadian authorities with respect to the foregoing suggestions.

Accept, Excellency, the renewed assurance of my highest consideration.

711.42157

(Signed) Charles E. Hughes

His Excellency,
The Right Honourable,
Sir Auckland Geddes, K. C. B.,
Ambassador of Great Britain.

(Reprint from Canadian Records)

Can. Ref.:-- Sessional Papers Vol. LVIII, No. 9, (1922);
Sessional Paper No. 89a, p. 4-6.

II. Letter from the Ambassador of Great Britain, to
His Excellency, Governor-General of Canada, Ottawa

BRITISH EMBASSY

No. 127

Washington, D.C., May 18, 1922.

MY LORD, - I have the honour to transmit herewith, for the information of Your Excellency's Ministers, a copy of a note dated May 17 which I have received from the Secretary of State, containing certain suggestions with reference to the report of the International Joint Commission with respect to the St. Lawrence River improvement scheme.

I understand from the State Department that the President is anxious to make public at the earliest possible moment a short statement to the effect that the United States Government have raised this question officially with the Government of the Dominion. I should, therefore, be glad if Your Excellency would inform me by telegram as soon as possible after the receipt of this despatch whether the Canadian Government have any objection to the publication of a statement to this effect. In making this announcement the United States Government do not propose nor desire to enter into any details as to the suggestions now communicated.

I have to add that I have received a lengthy despatch from His Majesty's Consul General at Chicago on the subject of the St. Lawrence River improvement, copies of which will be transmitted to Your Excellency as soon as they can be prepared.

I have the honour to be, My Lord,
Your Excellency's most obedient, humble servant

(Signed) A. C. Geddes.

His Excellency,
The Lord Byng of Vimy, G. C. B.,
etc., etc., etc.,
Governor General of Canada,
Ottawa, Canada.

(Reprint from Canadian Records)

Can. Ref.: Sessional Papers Vol. LVIII, No. 9 (1922);
Sessional Paper No. 89a, p. 3.

III. Press article released by the Department of State
of the United States, Washington

DEPARTMENT OF STATE

May 25, 1922.

FOR THE PRESS:

The Secretary of State, on May 17th, 1922, sent to the British Ambassador a note stating that the United States Government would be glad to take up with the Canadian Government the negotiation of a treaty looking to the deepening of the waterways which would enable ocean going ships to reach the Great Lakes.

The note to the British Ambassador referred to the fact that on January 21, 1920, the Government of the United States and Canada referred to the International Joint Commission for investigation and report, under the terms of Article IX of the Treaty of January 11, 1909, relating to Boundary Waters, questions with respect to the improvement of the St. Lawrence River between Lake Ontario and Montreal, both for navigation and the development of water power. This Commission reported on December 19, 1921.

The Secretary of State said that he was authorized to state that the President favors the negotiation of a treaty on the basis of this report of the International Joint Commission, or such modifications as might be agreed on, and requested to be informed as to whether the appropriate British and Canadian authorities are disposed to undertake the negotiation of a treaty.

The Department understands that this note has been forwarded to the Canadian Government. No answer has as yet been received.

Referred to: Public Works.

(Reprint from Canadian Records)

Can. Ref.: 14th Parliament, 3rd Sess., Sessional
Papers Vol. LX, No. 7, Sessional Paper
No. 101d, pp. 38-40.

IV. From the Charge d'Affaires ad interim of,
Great Britain, Washington, to the Governor
General of Canada, Ottawa

BRITISH EMBASSY

Washington, November 19, 1923.

MY LORD, - With reference to Your Excellency's despatch No. 82 of May 30th, 1922, I have the honour to transmit to Your Excellency herewith copy of a note from the United States Government enquiring whether the competent authorities of the Dominion Government have yet been able to give consideration to the St. Lawrence River improvement scheme and whether they are prepared to enter into negotiations with the United States Government on the lines suggested by Mr. Hughes in his note of May 17th, 1922, copy of which was communicated to Your Excellency by Sir Auckland Geddes in his despatch No. 127 of May 18th of that year.

I have the honour to be, my Lord,
Your Excellency's most obedient,
humble servant,

(Signed) H. G. Chilton.

His Excellency,

The Lord Byng of Vimy, G. C. B.,

etc., etc., etc.,

Governor General of Canada,
Ottawa, Canada.

(Reprint from Canadian Records)

Can. Ref.: - 14th Parliament, 3rd Sess., Sessional
Papers, Vol. LX, No. 7 (1924); Sessional
Paper No. 10ld, p. 42-43.

V. From the Ambassador of Great Britain, Washington,
to the Secretary of State of the United
States, Washington

BRITISH EMBASSY

Washington, January 30, 1924.

SIR:- I have the honour to refer to the note which you were so good as to address to me on November 17th last, regarding the St. Lawrence River improvement scheme and to inform you, by request of His Excellency the Governor General of Canada, that the Dominion Government have had under consideration the contents of your note addressed to Sir Auckland Geddes on May 17th, 1922. In that note you suggested either the immediate conclusion of a treaty looking to the development of the St. Lawrence waterway along the lines recommended by the International Joint Commission charged with the formulation of a complete plan which would be subject to the approval of the two Governments, or alternatively, the constitution of a Joint Commission of experts to make preliminary studies and investigations and to frame the draft to a treaty.

The Dominion Government point out that the report of the International Joint Commission recommended that, before any work was carried out, the Joint Engineering Board, whose proposals, it generally approved, should be enlarged, and that once so enlarged, the said Board should further consider the technical aspects of the problems in detail and decide upon the plan which should be adopted.

While the Government of Canada desire to give further consideration to the suggestions put forward in your note of May 17th, 1922, they are of opinion that the proposal made by the International Joint Commission should be acted upon without further delay. The Dominion Government are accordingly prepared to appoint additional engineers to enlarge the Joint Engineering Board with a view to the Board undertaking the preparation of a final report covering the engineering features of the whole project, including the cost. The Government of Canada intend, further, to form a committee which will, in consultation with

the Canadian members of the Joint Engineering Board, enquire fully from a national standpoint into the wide questions involved, and they hope shortly to be in a position to take further action on the proposals made by the United States Government.

Meanwhile the Government of Canada would be glad to learn the views of the United States Government in regard to the number of additional engineers who should be appointed by each Government to the Joint Engineering Board. The Dominion Government are also ready to nominate one or more technical officers to discuss with similar United States officers the form which the instructions to the enlarged Joint Engineering Board should take, and the time within which the Board should be directed to report.

In expressing the hope of the Government of Canada that the above proposals will be agreeable to the United States Government, I have the honour to inform you that Lord Byng of Vimy would be grateful if arrangements could be made by telegraph for their publication simultaneously in Washington and Ottawa.

I have the honour to be,

With the highest consideration, sir,

Your most obedient, humble servant,

(Signed) H. G. Chilton.

The Honourable Charles E. Hughes,
Secretary of State of the United States,
Washington, D. C.

(Reprint from Canadian Records)

Can. Ref.: - 14th Parliament, 3rd Sess., Sessional
Papers, 35-309, Vol. LX. No. 7 (1924);
Sessional Paper No. 101d, p. 43-44.

VI. From the Secretary of State of the United States,
Washington, to the Charge d' Affaires ad
interim of Great Britain, Washington

DEPARTMENT OF STATE

Washington, February 2, 1924.

Sir:-

I have the honour to acknowledge the receipt of your note No. 97, of January 30, 1924, communicating certain proposals made by the Government of Canada concerning joint action by the United States and Canada in regard to the improvement of the St. Lawrence River for navigation and water power.

The proposals made by the Government of Canada will receive the careful consideration of this Government and a further communication in regard to the matter will be made to you in due course.

Accept, Sir, the renewed assurance of my highest consideration.

(Signed) Charles E. Hughes.

Mr. Henry Getty Chilton,
Charge d'Affaires ad interim of Great Britain.

(Reprint from Canadian Records)

Can. Ref.: - 14th Parliament, 3rd. Sess., Sessional
Paper 35-309, Vol. LX No. 7 (1924);
Sessional Paper 10ld, p. 45.

VII. Letter from the British Embassy, Washington, to the Under Secretary of State for External Affairs, Ottawa, transmitting two copies of articles from Washington Post

BRITISH EMBASSY

Washington, February 6, 1924.

SIR, - I have the honour to transmit to you, herewith, copies of the paper mentioned below.

I have the honour to be,
Your most obedient servant,

(Signed) - (Signature omitted in Sessional Paper)

The Under Secretary of State for External Affairs,
Ottawa, Canada.

NAME AND DATE

SUBJECT

2 copies articles from Washington Post, Feb. 6, 1924.	St. Lawrence Deep Waterways
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Referred to: Public Works.

2756 - 1C

Washington Post, February 6, 1924.

CANADA READY TO ACT ON LAKES WATERWAY

Will Appoint St. Lawrence River Project Engineers
Hughes Advised

The Canadian government, in a note transmitted to the State Department through the British Embassy, has declared its readiness to act without delay on certain proposals made by the International Joint Commission for improvements in the St. Lawrence river between Montreal and Lake Ontario to make possible deep water navigation into the Great Lakes.

VIII The Ottawa government asserts that it desires to give further consideration to some of the suggestions made by Secretary Hughes to Sir Auckland Geddes, British Ambassador, in a note transmitted in May, 1922, but is prepared now to appoint additional engineers to enlarge the joint engineering board and undertake the preparation of a final report covering "the engineering features of the whole project, including its cost."

(Reprint from Canadian Records)

Can. Ref.: - 14th Parliament, 3rd Sess., Sessional Papers 35-309, Vol. LX. No. 7 (1924); Sessional Paper No. 101d, p. 45.

The Under Secretary of State for External Affairs,
Ottawa, Canada.

NAME AND DATE

SUBJECT

8 copies article from Washington Post, January 10, 1924.

Referred to: Public Works.

1924 - 10

STILL IN PROGRESS

Speaker Francisco Villa Will Visit Baltimore
From Mexico

Special Dispatch to the Press

Baltimore, February 10. The steady war with ship grain and iron ore in Baltimore as an alternative route when the Great Lakes St. Lawrence waterway project is a reality. Senator Charles C. Smith son of the Southern Iron Ore Development League, speaking to the Foreign Trade Club here tonight.

VIII. Letter from the British Embassy, Washington, to the Under Secretary of State for External Affairs, Ottawa, transmitting two copies of articles from Washington Star

BRITISH EMBASSY

Washington, February 19, 1924.

SIR, - I have the honour to transmit to you, herewith, copies of the paper mentioned below.

I have the honour to be,
Your most obedient servant,

(Signed) M. M. Mahoney.

The Under Secretary of State for External Affairs,
Ottawa, Canada.

NAME AND DATE

SUBJECT

2 copies article from Washington Star, Feb. 18, 1924.	St. Lawrence Deep Waterway
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Referred to: Public Works.

2756 - 1C

RIVERS WATERWAY PLAN

Speaker Predicts Grain Will Reach Baltimore
From Lakes

Special Dispatch To The Star:

Baltimore, February 18. The middle west will ship grain and iron direct to Baltimore by an all-water route when the Great Lakes St. Lawrence waterway project is a reality, declared Charles M. Jackson of the Northern New York Development League, speaking to the Foreign Trade Club here Saturday.

He predicted that Canada and the United States will join to build the waterway and asserted that it could be built in ten years at a cost of \$250,000,000. This cost, he said, would build two canals, a channel in the St. Lawrence and a power plant of 1,500,000 horsepower that would pay the bill within fifty years by selling power at two mills per kilo-watt hour.

Mr. Jackson said the railroads are in favour of the plan and that President Coolidge and a majority of the cabinet and Congress, as well as a majority in the Canadian Government, approve it.

(Reprint from Canadian Records)

Can. Ref.: - 14th Parliament, 3rd. Sess., Sessional Papers Vol. LX, No. 7 (1924);
Sessional Paper No. 10ld, p. 46.

You informed me also that the Government of Canada intends to form a committee which will in consultation with the Canadian members of the Joint Engineering Board, inquire fully from a national standpoint into the wide questions involved in the project.

In reply permit me to say that this Government is gratified to learn that the Canadian Government hopes shortly to be in a position to take further action on the proposals made in my note of May 17, 1922, and meanwhile is especially pleased to be advised that the Government of Canada intends to create a committee for the purpose described in your note. This Government similarly, will immediately constitute a National Committee which will in consultation with the American members of the Joint Engineering Board make adequate inquiry from a national standpoint into the questions involved to the end that the project for the improvement of the St. Lawrence River for navigation and the development of its water power

IX. From the Secretary of State of the United States,
Washington, to the Charge d' Affaires ad
interim of Great Britain, Washington

DEPARTMENT OF STATE

Washington, February 27, 1924.

SIR, - In your note of January 30th, 1924, in regard to the project for joint action by the United States and Canada for the improvement of the St. Lawrence River between Montreal and Lake Ontario for navigation and the development of water power, you informed me that while the Government of the Dominion of Canada desires to give further consideration to the suggestions brought forward to my note of May 17, 1922, to Sir Auckland Geddes with a view to carrying out the recommendations made by the International Joint Commission, the Dominion Government is nevertheless prepared to act without delay on the recommendation for the enlargement of the International Engineering Board which assisted the Commission in making the investigation of the project and to appoint additional engineers to the Board with a view to having it undertake the preparation of a final report covering the engineering features of the whole project, including the cost.

You informed me also that the Government of Canada intends to form a committee which will in consultation with the Canadian members of the Joint Engineering Board, inquire fully from a national standpoint into the wide questions involved in the project.

In reply permit me to say that this Government is gratified to learn that the Canadian Government hopes shortly to be in a position to take further action on the proposals made in my note of May 17, 1922, and meanwhile is especially pleased to be advised that the Government of Canada intends to create a committee for the purpose described in your note. This Government similarly, will immediately constitute a National Committee which will in consultation with the American members of the Joint Engineering Board make adequate inquiry from a national standpoint into the questions involved to the end that the project for the improvement of the St. Lawrence River for navigation and the development of its water power

may be carried forward as speedily as possible.

This Government is glad to give its assent to the suggestion that the Joint Engineering Board should be enlarged and, in response to the request of the Canadian Government for its view as to the number of additional engineers which should be appointed, suggests that two engineers be added to the Board of each Government, the membership of the Board thus being increased to six, three of whom would be representatives of the United States and three would be representatives of Canada. In connection with this enlargement of the Board it may be noted that the first of the recommendations made by the International Joint Commission was that the Government of the United States and Canada enter into an arrangement by way of treaty for a scheme of improvement of the St. Lawrence River between Montreal and Lake Ontario. It would appear that the Commission did not contemplate that negotiations for a treaty should be postponed until after a report should be made by an enlarged board of engineers but that negotiations should forthwith be opened, that the proposed works between Montreal and Lake Ontario should "be based upon the report of the Engineering Board" accompanying the report of the Commission and that the Governments should have the benefit of the advice of an enlarged Board of Engineers before a "final decision" should be reached.

This Government would propose that the instructions to the enlarged Engineering Board should be prepared in joint conference by the two advisory committees which the Governments of Canada and the United States intend to establish as indicated in your note and this reply, and that the two committees should accordingly be empowered to meet in joint conference for the purpose of formulating such instructions. However, the instructions would be given to the Board of Engineers by the Governments and the report of the engineers would be made to the Governments.

As it appears that the report of the Board of Engineers of June 24, 1921, while of a preliminary character as contemplated in their instructions, nevertheless presented a general plan believed to be practicable in its main features, this Government would desire to have included in the first instructions to the enlarged Board

the two fundamental questions whether the scheme for the improvement of the St. Lawrence Waterway which the Board presented in its report of June 24, 1921, is practicable and whether the estimates of costs made by it require revision. The time within which the Board should make its report should, as was suggested by the Canadian Government, be determined in advance and stated in the instructions. It is believed that the fundamental questions can be reported upon within a short time. If the suggestion that the instructions to the Joint Engineering Board be prepared by the two advisory committees in joint conference be acceptable to the Canadian Government the appointment of technical officers especially for this purpose as proposed by the Canadian Government would not be necessary.

This Government further suggests that the two committees be empowered to meet from time to time in joint session in order to prepare supplemental instructions for the Board of Engineers as occasion may require, and to consider and develop the broader aspects of the whole matter so that each committee may be as helpful to the other as possible.

This Government is hopeful that the foregoing proposals will be acceptable to the Government of Canada, and I should be pleased if arrangements can be made by telegraph for publishing them simultaneously at Washington and Ottawa.

Accept, Sir, the renewed assurance of my high consideration.

711.42157

(Signed) Charles E. Hughes.

Mr. Henry Getty Chilton,

Charge d'Affaires ad interim of Great Britain.

(Reprint from Canadian Records)

Can. Ref.:— 14th Parliament, 3rd. Sess., Sessional Papers Vol. LX. No. 7 (1924);
Sessional Paper No. 101d, p. 47-48.

X. From the Secretary of State of the United States,
to the Ambassador of Great Britain,
Washington

DEPARTMENT OF STATE

Washington, April 28, 1924.

EXCELLENCY, - In your note of March 12, 1924, you informed me further in regard to the views of the Canadian Government with reference to the proposal for joint action by the United States and Canada for the improvement of the St. Lawrence River between Montreal and Lake Ontario for navigation and the development of water power.

In pursuance of the intention of this Government, as stated in my note of February 27, 1924, the President has appointed a national committee of nine members having as its Chairman the Honourable Herbert Hoover, Secretary of Commerce, which will act as an advisory committee to this Government on all questions that may arise in the consideration of the project.

While regretting that the Canadian Government does not desire that the committees for the two Governments shall meet in joint conferences, at least at the outset, to prepare instructions for the enlarged joint engineering board and to consider the broader aspects of the project for the proposed development of the St. Lawrence waterway, this Government would be grateful if you would inform the Canadian Government that the National Committee for the United States will be prepared at all times to meet in conference with the Canadian Government in the event that circumstances should develop which in the view of the Canadian Government would cause it to appear that joint conferences by the two committees or by representatives of the committees might be desirable for the consideration of any question arising in connection with the project.

This Government is pleased to note that the Canadian Government concurs in its suggestion that the enlarged Joint Engineering Board shall consist of six members, three representing the United States and three representing Canada, and to accept the proposal of the Canadian Government that two technical officers be appointed by each Government for the purpose of formulating the terms

in which the matters to be inquired into by the Board shall be defined.

The United States will be represented on the Joint Engineering Board by Colonel Edgar Jadwin, Colonel William Kelley, and Lieutenant Colonel George E. Pillsbury, Corps of Engineers, United States Army. Colonel Jadwin and Lieutenant Colonel Pillsbury will also act as technical officers for the United States to formulate in collaboration with the technical officers to be designated by the Canadian Government the instructions which will be given to the engineers.

This Government is also pleased to note the acceptance by the Government of Canada of the proposal of this Government that there shall be included in the first instructions to the Joint Engineering Board the two fundamental questions, whether the scheme for the improvement of the St. Lawrence River waterway which the Engineering Board submitted in its report of June 24, 1921, is practicable and whether the estimates of the costs of the project made by the Board require revision, and to agree to the suggestion made by the Dominion Government that amongst other matters the enlarged Board shall be directed to enquire into the extent to which the water levels in the St. Lawrence River at and below Montreal, as well as the river and lake levels generally, will be affected by the execution of the project.

It will, of course, be understood that the instructions drafted by the technical officers will be subject to review and approval by the appropriate officials to the respective Governments before they would be given to the Board of Engineers by the Governments in conformity with the remark made on that point in my note of February 27, 1924. In connection with such review and approval, the instructions drafted by the technical officers will be submitted by the officers for the United States to the National Committee, for this Government.

This Government would be pleased to be informed at the early convenience of the Canadian Government of the names of the technical officers appointed by that Government in order that the officers for the two Governments may make arrangements with as little delay as possible to collaborate in the drafting of the instructions for the Joint Engineering Board. This Government would also be pleased to be informed in due course of

the names of the Canadian members of the Joint Engineering Board.

Accept, Excellency, the renewed assurances of my highest consideration.

(Signed) Charles E. Hughes.

His Excellency
The Right Honourable
Sir Esme Howard, G.C.M.G., K.C.B., C.V.O.
Ambassador of Great Britain.

(Reprint from Canadian Records)

Can. Ref.: - 14th Parliament, 3rd. Sess., Sessional
Papers Vol. 60 No. 7 (1924);
Sessional Paper No. 101e, p. 93-94.

XI. Telegram from Lord Byng, Ottawa, to the Ambassador of
Great Britain, Washington

CODE TELEGRAM FROM THE GOVERNOR GENERAL TO HIS
MAJESTY'S AMBASSADOR AT WASHINGTON

Ottawa, May 7, 1924.

With reference to your despatch No. 167 of the 29th
April. St. Lawrence River.

The Government of Canada has selected as its representatives on the Board - Duncan W. McLachlan, B. Sc., Ottawa; Olivier Odilon Lefebvre, Chief Engineer, of the Quebec Streams Commission, Montreal, P. Q.; and Brigadier-General Charles Hamilton Mitchell, C. B., C. M. G., B. A. Sc., C. E., of Toronto; and of them the two last mentioned will act as technical officers on its behalf to settle the terms of reference.

The Canadian Government entirely concurs with the Government of the United States that it should be understood that the instructions drafted by the technical officers will be subject to approval by the respective Governments before being given to the Board, and these instructions will be submitted by the technical officers for Canada to the Canadian National Advisory Committee which has been constituted under the Chairmanship of the Honourable George P. Graham, Minister of Railways and Canals, and which includes among its members the Honourable Walter Edward Foster, of St. John, N. E., The Honourable Sir Clifford Sifton, K. C. M. G., K. C., of Toronto, Ontario; Dr. Wilfrid Laurier McDougald, of Montreal, P. Q.; Major-General John William Steward, C. B., C. M. G., of Vancouver, B. C.; the Honourable Adelard Turgeon, C. M. G., C. V. O., of Quebec, P. Q.; and Messrs. Thomas Ahearn, of Ottawa, Beaudry Leman, B. Sc., C. E., of Montreal, P. Q.; and Edward D. Martin, of Winnipeg, Man.

The Canadian Government suggests that the unpublished despatches should be released for publication in the afternoon papers of Friday, May 9th.

(Signed) Byng.

(Reprint from Canadian Records)

Can. Ref:- 14th Parl., 3rd. Sess., Sess. Papers Vol. LX,
No. 7, (1924); Sessional Paper No. 101e, p. 95.

XII. From the Secretary of State of the United States, Washington, to the Minister of the Dominion of Canada, Washington

April 13, 1927.

SIR, - For more than one hundred years, the Great Lakes and the St. Lawrence River have furnished a common highway and transportation outlet for the population in the interior of the continent in both the United States and Canada. The waterway has been the subject of several treaties and conventions between the two countries. Its development has been a matter of continuous effort on the part of both countries.

Pursuant to reference made to the International Joint Commission by both governments under authority of the treaty of January 11, 1909, that commission made investigation of the feasibility of improving navigational facilities of the St. Lawrence River between Montreal and Lake Ontario so as to transform that section into an ocean shipway. The Commission submitted its report, signed on December 19, 1921, to your Government and to the Government of the United States after taking into consideration the existing characteristics of the waterway and its projected development, as well as the essential economic factors. It earnestly recommended to both governments the making of a treaty for a scheme of shipway improvement of the river between Montreal and Lake Ontario. It suggested, however, that before final decision be made the engineering features should receive further consideration and study. Delays naturally ensued due to the problems of reconstruction resulting from the war.

On March 14, 1924, the President of the United States appointed the St. Lawrence River Commission under the chairmanship of the Honourable Herbert Hoover, Secretary of Commerce, to consider the whole project in its economic and national aspects and to express an opinion as to whether the project should be undertaken, and the Government of Canada, on May 7, 1924, appointed a national advisory committee under the chairmanship of the Honourable George Perry Graham, Minister of Railways and Canals. Through the arrangements brought about by these committees the two

governments by exchange of notes dated February 4 and March 17, 1925, gave instructions to a Joint Board of Engineers designated by them to review and extend the engineering plans as recommended by the International Joint Commission in 1921.

This Joint Engineering Board made an elaborate resurvey of the lake and river systems both as to navigation and power, and filed with each government an exhaustive report upon all its engineering aspects. The representatives of the two countries differed as to a few details but from the report it clearly appears that the improvement of the waterway for navigation and power purposes is both feasible and advisable.

The St. Lawrence River Commission appointed by the President to advise this Government on the subject recently undertook an examination of all of the economic as well as engineering facts bearing upon the proposed development and has made a complete report covering all aspects. It concluded that the construction of the shipway at proper depths would relieve the interior of the continent, especially agriculture, from the economic handicaps of adverse transportation costs which now operate to the disadvantage of many states and a large part of Canada, would serve the industrial well-being of both countries in the development of their power resources, and would tend largely to the increase of prosperity and the stimulation of industry. The Commission recommended that negotiations should be entered into with your Government in an endeavour to arrive at an agreement as to the speedy development of this waterway.

The Government of the United States adopts the recommendations of the St. Lawrence Commission. It appreciates the advantages which will accrue equally to both countries by the opening of the waterway to ocean shipping. It feels that the necessary increase in railway rates due to the war, and the modern practices respecting the generation and transmission of hydro-electric power, have increased the importance and practicability of early development, and believes that the factors which influence its conclusions must have equal application to, and influence upon, the Dominion of Canada.

In view of the action already taken by both gov-

ernments, it is apprehended that they are in accord on the principle that the project should be undertaken. If this Government's conclusion in this respect be correct, there only remains to be effected an understanding as to the methods and means for its earliest accomplishment. It seems highly appropriate that the development of the common highway for the benefit of both countries should be jointly undertaken.

This Government is prepared to enter into negotiations with a view to the formulation of a convention appropriate to this subject and should be grateful to be informed of the views entertained on this subject by your Government.

Accept, Sir, the renewed assurance of my highest consideration.

(Signed) Frank B. Kellogg.

The Honourable Vincent Massey,
Minister of the Dominion of Canada.

(Reprint from Canadian Records)

Can. Ref:- A Monograph entitled, "St. Lawrence Waterway Project," 1928, pp. 5-6.

The National Advisory Committee appointed by the Government of Canada to report on the economic and general aspects of the St. Lawrence Waterway question will not be in a position to make a final report until all the findings of the Joint Engineering Board, including the appendices, are available. Upon receipt of the report of the National Advisory Committee and upon consideration of the other factors involved, the Government of Canada will be able to determine its policy on the question, and will have pleasure in discussing further with the Government of the United States at as early a date as possible the whole situation, including the proposals contained in the present note of the Secretary of State.

Accept, sir, the renewed assurances of my highest consideration.

(Signed) W. L. Mackenzie King.

XIII. From the Secretary of State for External Affairs, Ottawa, to the Minister of the United States, Ottawa

Ottawa, July 12, 1927.

SIR, - The Government of Canada has received and considered carefully the note of the Secretary of State of the United States to the Canadian Minister at Washington of April 13th, 1927, on the St. Lawrence Waterway.

It shares the appreciation felt by the Government of the United States of the importance of the problem of the development of the St. Lawrence and of the aid in the solution of the engineering aspects of this problem afforded by the reports of the International Joint Commission and of the Joint Board of Engineers appointed by the two Governments in 1925.

The report of the Joint Board of Engineers signed on November 16th, 1926, while unanimous in many respects, indicated differences of opinion on important phases of the development proposed. It is understood that in the appendices to the report, which are in preparation, certain further alternative schemes will be presented which will be of essential value in arriving at a conclusion.

The National Advisory Committee appointed by the Government of Canada to report on the economic and general aspects of the St. Lawrence Waterway question will not be in a position to make a final report until all the findings of the Joint Engineering Board, including the appendices, are available. Upon receipt of the report of the National Advisory Committee and upon consideration of the other factors involved, the Government of Canada will be able to determine its policy on the question, and will have pleasure in discussing further with the Government of the United States at as early a date as possible the whole situation, including the proposals contained in the present note of the Secretary of State.

Accept, sir, the renewed assurances of my highest consideration.

(Signed) W. L. MacKenzie King.

The Honourable William Phillips,
Minister of the United States,
Ottawa.

No. 30.

January 31, 1928.

(Reprint from Canadian Records)

Can. Ref:- A Monograph entitled, "St. Lawrence
Waterway Project", 1928, pp. 6-7.

Acknowledgment of this communication was made in a note of July 13, 1927, addressed to the Minister of the United States at Ottawa, in which it was stated that, as the report of the Joint Board of Engineers indicated differences of opinion as to the solution of the engineering difficulties presented by the international section of the waterway, the National Advisory Committee, appointed by His Majesty's Government in Canada to report on the economic and general aspects of the waterway question, would not be in a position to advise the Government until certain alternative schemes under consideration by the Joint Board, and to be included in the appendix of the main report, had been devised and considered.

The full report of the Board has now been received, and the National Advisory Committee, which met in Ottawa this month, has reported its conclusions to His Majesty's Government in Canada. The National Advisory Committee concurs in the finding of the Joint Board of Engineers that the project is feasible. It recommends, however, that should the work be undertaken, fuller allowance should be made for future requirements by providing, in addition to 30-foot depth for the permanent structures, 27-foot navigation in the reaches rather than the 26-foot navigation proposed by the Joint Board. While the National Advisory Committee regards the project as feasible from an engineering standpoint, and notes the findings of the International Joint Commission in 1921 as to its economic practicability, it considers that the question of its advisability

XIV. From the Minister of the Dominion of Canada,
Washington, to the Secretary of State of the
United States, Washington

No. 30.

January 31, 1928.

SIR, - I have the honour to refer to your note of April 13, 1927, in which, after reviewing the steps taken in recent years by the United States and Canada to enquire into the feasibility of a St. Lawrence ocean shipway, you stated that the Government of the United States had accepted the recommendations of the St. Lawrence River Commission, appointed by the President as an advisory body, and was accordingly prepared to enter into negotiations with Canada with a view to formulating a convention for the development of the waterway.

Acknowledgment of this communication was made in a note of July 12, 1927, addressed to the Minister of the United States at Ottawa, in which it was stated that, as the report of the Joint Board of Engineers indicated differences of opinion as to the solution of the engineering difficulties presented by the international section of the waterway, the National Advisory Committee, appointed by His Majesty's Government in Canada to report on the economic and general aspects of the waterway question, would not be in a position to advise the Government until certain alternative schemes under consideration by the Joint Board, and to be included in the appendices to the main report, had been received and duly considered.

The full report of the Board has now been received, and the National Advisory Committee, which met in Ottawa this month, has reported its conclusions to His Majesty's Government in Canada. The National Advisory Committee concurs in the finding of the Joint Board of Engineers that the project is feasible. It recommends, however, that should the work be undertaken, fuller allowance should be made for future requirements by providing, in addition to 30-foot depth for the permanent structures, 27-foot navigation in the reaches rather than the 25-foot navigation proposed by the Joint Board. While the National Advisory Committee regards the project as feasible from an engineering standpoint, and notes the findings of the International Joint Commission in 1921 as to its economic practicability, it considers that the question of its advisa-

bility at the present time depends upon the successful solution of a number of financial and economic difficulties, and upon further consideration of certain of the engineering features as to which the two sections of the Joint Board of Engineers are not as yet agreed. I am instructed by the Secretary of State for External Affairs to inform you that His Majesty's Government in Canada concurs in these conclusions of the National Advisory Committee.

In your note of April 13, it was observed that the St. Lawrence River Commission had reported that the construction of a shipway at proper depth would relieve the interior of the continent, especially agriculture, from the economic handicaps of adverse transportation costs which, it was indicated, now operate to the disadvantage of many States and a large part of Canada. It was added that the Government of the United States appreciated the advantages which would accrue equally to both countries by opening up the waterway to ocean shipping, and that the necessary increase in United States railway rates due to the war, and the desirability of early development of hydro-electric power, were factors which must have equal application to, and influence upon, the Dominion of Canada.

In view of the implications as to Canadian conditions contained in these observations, it may be well to indicate certain features of the transportation situation in Canada which have a direct bearing upon the St. Lawrence waterway question.

For many years past the improvement of transportation has been the foremost task of successive governments of Canada. At heavy cost, an extensive program of railway, waterway, and harbour development has been carried out, with the object of linking up all parts of the Dominion and providing adequate outlets for foreign trade. Two great transcontinental railway systems have been built up, largely with state aid, and both western and eastern Canada are now reasonably well served by railways, though increasing settlement and increasing production render it necessary for both systems to continue to spend large sums annually in the provision of branch lines. Western Canada is now looking to the early completion of the Hudson Bay route to

Europe. This route, which it is anticipated will be available in about three years, will shorten the haul to Europe from the Canadian West by a thousand miles and more, and will also be of substantial benefit to shippers from the Western States. Since that work was projected, the completion of the Panama Canal, by the efforts of the United States, has supplied an alternative outlet for much of western Canada through Vancouver and Prince Rupert; and at the present time the Canadian Government is faced with a strong demand for an additional and more direct outlet to the Pacific for the Peace River country. The St. Lawrence route itself has been progressively improved, and has proved of steadily increasing service.

Partly as a result of the existence of competitive alternative outlets, railway rates in Canada are in general lower than in the United States. The rates on grain, which provides fifty-two per cent of the total traffic of western lines, are now below pre-war level. Material reductions have also been made in another bulk movement of importance to both eastern and western Canada, namely, coal. General commodity rates, which were the subject of the same percentage of relative increase in both countries, due to war conditions, have subsequently been reduced in Canada, in certain instances, to a greater extent than in the United States. In recent months a rate on grain has been established from the head of the Lakes to Quebec which approximates the charges incident to the movement by water by the present Great Lakes - St. Lawrence route, a route which, in Canada, has always exercised a restraining influence on railway rates. As the greater part of Canada's railway mileage is now owned and operated by the State, the St. Lawrence proposals, in so far as they may possibly affect the revenues of the railways, present considerations as to which Canada's point of view is necessarily somewhat different from that of the United States.

Canada's interest in the improved navigation of the Great Lakes - St. Lawrence route would be associated largely with the movement of bulk commodities, such as grain, timber and coal. The movement of package freight by water in Canada is at present of small volume, and Canadian railways, unlike, it is understood, those of the Midwest of the United States, are in a position to handle much more of that traffic than at present is offered.

It is believed that development of the waterway

would prove of advantage to Canadian commerce and industry, not merely in the sections directly tributary to the Great Lakes and St. Lawrence, but in the Maritime sections, which would be afforded more direct access to the great interior markets of the continent. It is, however, apparent that the United States would benefit much more from the enlarged navigation facilities, both in extent of use and in margin of saving. The report of the International Joint Commission in 1921, after a comprehensive review of the economic aspects of the project, presented the following conclusions, to which the National Advisory Committee calls attention: -

"As to the economic practicability of the waterway, the Commission finds that, without considering the probability of new traffic created by the opening of a water route to the seaboard, there exists today, between the region economically tributary to the Great Lakes and overseas points as well as between the same region and the Atlantic and Pacific seabords, a volume of outbound and inbound trade that might reasonably be expected to seek this route sufficient to justify the expense involved in its improvement.

"It finds that, as between the American and Canadian sides of the tributary area, the former contributed very much the larger share of this foreign and coastwise trade, and in all probability will continue to do so for many years to come. The benefits to be derived from the opening of a water route to the sea will, therefore, accrue in much larger measure to American than to Canadian interests, though it is reasonable to assume that eventually the advantages may be more evenly distributed."

The report of the International Joint Commission continues, in a direct reference to comparative transportation conditions: -

"It finds that the existing means of transportation between the tributary area in the United States and the seaboard are altogether inadequate, that the railroads have not kept pace with the needs of the country, but that this does not apply to the Canadian side of the area, where railway development is still in advance of population and production."

It will therefore be observed that the transportation situation in the two countries is not identical as to available facilities, extent of use, or rates and that the economic handicaps to which you referred in your note of April 13 appear to have more application to United States than to Canadian conditions. In this connection, it may be said that Canadian agriculture is more directly affected by the restrictions on the importation of Canadian farm products which have been imposed by the United States in recent years, with the object, it is understood, of assisting agriculture in those Western States which would share so largely in the benefits of the proposed St. Lawrence Waterway. This situation, and the effects upon the Maritime sections of Canada of United States duties on the products of the fisheries, are among the factors which have contributed to bringing it about that public opinion in Canada has not so clearly crystallized in favour of the waterway project as appears to be the case in the United States.

Reference was made in your note to the early development of hydro-electric power as a factor which must have equal application to and influence upon the Dominion of Canada. The opportunity of developing great quantities of power incidental to navigation is, it is agreed, a special advantage possessed by the St. Lawrence project, and an important consideration in determining its advisability. In this aspect of the project, however, there are again special features in the Canadian situation which it is desirable to make clear. Public opinion in Canada is opposed to the export of hydro-electric power, and is insistent that such power as may be rendered available on the St. Lawrence, whether from the wholly Canadian section, or from the Canadian half of the international section, shall be utilized within the Dominion to stimulate Canadian industry and develop the national resources. With this view the National Advisory Committee expresses itself as in complete accord. The Committee further indicates that, in view of the relatively limited capacity of the Canadian market to absorb the vast blocks of power contemplated by the St. Lawrence proposals, it follows that it is most important, in any arrangement which may be considered, that the development of power on the Canadian side should not exceed the capacity of the Canadian market to absorb it.

The situation presented by the differences of opinion brought out in the report of the Joint Board of Engineers as to the best method of development in the international section of the St. Lawrence has also received consideration by the National Advisory Committee. The Committee considers it greatly in the public interest that a further attempt should be made to reconcile these varying views. Conclusive assurance is necessary as to control of the fluctuations of flow from Lake Ontario, so essential to the interests of the purely national sections of the river and the port of Montreal, and as to the situation of those Canadian communities on the St. Lawrence, which under certain of the present plans might be obliged to live under levees or to rebuild in part. A plan has been presented in the appendices to the report of the Joint Board of Engineers proposing an alternative location of the upper works of the Canadian two-stage plan. It is also considered advisable that opportunity should be afforded for further conference on these alternative proposals between the Canadian section of the Joint Board and engineers representing the Province of Ontario, who have themselves formulated plans dealing with the international section.

The financial phases of the project have been reviewed by the Committee. It is pointed out that for many years Canada has been engaged in improving the navigation of the St. Lawrence river, both above and below Montreal, and in providing navigation facilities across the Niagara peninsula. At the same time, the United States has been similarly engaged in deepening inter-connecting channels of the Upper Lakes, and in providing suitable works at Sault Ste. Marie. Towards the common object, Canada has made particularly heavy contributions. It has expended over thirty millions on the ship channel which has made possible ocean navigation on a large scale to the port of Montreal, an expenditure by which the proposed St. Lawrence project will directly benefit. The Dominion has spent fifty millions on canals and channel improvements between Montreal and Lake Erie, in which improved navigation United States shipping has had equal use and advantage. To the present, Canada has spent eighty-seven millions on the Welland Ship Canal. In view of these facts and of the very heavy financial burdens imposed by the war, by the railway obligations arising out of the war, and by the necessity, since the war ended, of finding the

large sums required for needed public works throughout the Dominion, it is considered that it would not be sound policy to assume heavy public obligations for the St. Lawrence project.

The National Advisory Committee has reached the conclusion that it is possible to work out a method by which provision could be made for the construction of the waterway on terms which would be equitable to both countries and would take adequate account of the special factors in the Canadian situation to which attention has been directed. Several methods have been considered, but the plan which chiefly commends itself to the Committee is, in brief, that Canada should consider providing for the construction of the waterway in the sections wholly Canadian, that is, the Welland Ship Canal and the works in the St. Lawrence below the international boundary, and that the United States should consider undertaking the completion of a 27-foot waterway to the head of the Lakes, in addition to meeting the entire cost of the development, under joint technical supervision on lines to be agreed upon, of the international section of the St. Lawrence, both for navigation and for power. The construction of the wholly Canadian (Welland and St. Lawrence) sections, and, if the United States should see fit, of the upper lakes works would, on this plan, be given precedence of the international section, because of the necessity alike of providing for further consideration of the engineering problems involved in the international section and of permitting reasonable absorption of the power developed on the Canadian side.

In support of this view, the following statement is submitted by the Committee, based on expenditures by both countries on the present through waterway, and on the estimated cost of the presently recommended scheme, with 27-foot navigation, a new United States lock at Sault Ste. Marie of the same dimensions as proposed for the St. Lawrence Shipway, and the development, on the St. Lawrence, of such power as is incidental to navigation: -

CANADA

Present works:

St. Lawrence ship channel...	\$30,000,000
St. Lawrence and Welland	
Canals.....	50,000,000

Lock at Sault Ste. Marie, Ontario.....	5,560,000	\$ 85,560,000
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Proposed works:

Welland ship canal.....	\$115,600,000	
Wholly Canadian section, St. Lawrence shipway, 27- ft. navigation and develop- ment of 949,300 h.p.....	199,670,000	\$315,270,000

Total for Canada.....		\$400,830,000
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UNITED STATES

Present works:

Dredging St. Clair and Detroit rivers.....	\$ 17,536,000	
Locks at Sault Ste. Marie, Michigan.....	26,300,000	\$ 43,836,000

Proposed works:

International section St. Lawrence shipway 27-ft. navigation and initial de- velopment of 597,600 h.p..	\$182,157,000	
To complete development - additional power 1,602,000 h.p.....	92,090,000	
Upper lake channels to 27-ft.	65,100,000	339,347,000

Total for United States.....		\$383,183,000
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In bringing these conclusions of the National Advisory Committee to the attention of the Government of the United States, His Majesty's Government in Canada desires to add that there are phases of the question, particularly as regards the development of power, as to which it is necessary to take account of the special concern of the two provinces of Canada bordering on the waterway. The relation between navigation and power involves certain constitutional difficulties, of which, in accordance with the wishes of the Governments of

Ontario and Quebec, the Government of Canada proposes to seek a solution by reference to the Courts. With this preliminary difficulty in process of solution, the Government of Canada will be in a position, upon learning from the Government of the United States whether in its view the procedure above outlined affords an acceptable basis of negotiation, to consult with the Provinces of Ontario and Quebec on the aspects of the problem with which they may be concerned, and thus to facilitate an understanding being reached between all concerned as to the methods and means by which the project could be undertaken.

It is the hope of the Government of Canada that, in any such further consideration of the waterway question, opportunity may be found for reaching a comprehensive settlement of all outstanding problems affecting the Great Lakes and the St. Lawrence, including the preservation of the waters properly belonging to the St. Lawrence watershed, of which the present discussion indicates the paramount importance.

I shall be obliged if you will be good enough to inform me at your convenience, for transmission to His Majesty's Government in Canada, of the views of the Government of the United States on the representations which are outlined above.

I have, etc.,

(Signed) Vincent Massey.

The Honourable Frank B. Kellogg,
Secretary of State of the United States,
Washington, D. C.

(Reprint from Canadian Records)

Can. Ref:- A Monograph entitled, "St. Lawrence Waterway Project," 1928, pp. 7-12.

U. S. Ref:- Congressional Record - Appendix - April 17, 1928, pp. 6936-38.

XV. From the Secretary of State of the United States,
Washington, to the Minister of the
Dominion of Canada, Washington

March 12, 1928.

Sir,- I have the honour to acknowledge your note of January 31, 1928, in which you inform me of the findings and recommendations of the National Advisory Committee in regard to the proposed St. Lawrence waterway improvement.

I note the view of the National Advisory Committee that the question of the advisability of the improvement at the present time depends upon the solution of a number of financial and economic difficulties and upon further consideration of certain of the engineering features and the conclusion of the Committee that it is possible to work out a method by which provision could be made for the construction of the waterway on terms which would be equitable to both countries and would also take adequate account of the factors in the Canadian situation which you have set forth.

The suggestions outlined in your note have received thorough consideration. While the United States is not in complete agreement with the representations made by the Canadian Government as to the relative benefits and ultimate costs to the two countries of the proposed improvement of the St. Lawrence and the division of expense to be borne by each country, it is inclined to regard as an acceptable basis of negotiation a proposal along the general lines suggested in your note; that the prosecution of the improvement of the St. Lawrence waterway be based on the undertaking by the United States of the deepening of the necessary channels through the interconnecting waters of the Great Lakes and the improvement of the international section of the St. Lawrence both for navigation and for power; and the undertaking by Canada of the construction of the waterway in the sections wholly Canadian, that is, the Welland Canal and the works in the St. Lawrence below the international boundary.

Whether the United States expends its share of the cost on the international section and Canada its share on the national sections would seem to be immaterial, if, in the negotiations, there is a fair division of expense

for a through deep waterway to the Ocean. Of course, in such an arrangement, all sections of the deep waterway should be so constructed as to make them most suitable for a through system of transportation. This is a detail to which I have no doubt your Government will entirely agree. The use of the waterway should be properly safeguarded by treaties between the two countries.

Concerning the value of the route to the sea to the two countries, I have noted the suggestions made in your note of January thirty-first. I might say that, while it may not be very material to the main issue, the United States has the use of the Panama Canal which is of great benefit to it especially on the Pacific, Atlantic and Gulf coasts. It has also the use of the Gulf of Mexico which reaches a considerable way across the Continent on the South and furnishes valuable water transportation for a large portion of the Southwestern part of the United States. Both of these waterways exercise a great influence on freight rates. The United States has other harbours on the Atlantic, such as New York served by both railways and the Erie Canal, Philadelphia, Baltimore and Norfolk, which involve a shorter railroad haul from the Great Lakes territory to the Ocean than is enjoyed by Canada. Nevertheless, I feel that the construction of a deep waterway through the St. Lawrence to the Ocean will be of tremendous advantage to most, if not all, of the territory in the northern part of the United States, as well as to the corresponding territory in Canada.

Referring to your suggestions as to the order in which the different works should be undertaken, it would seem to me that this matter will also have to be the subject of negotiation because the works ought to proceed so that all parts of the navigation system would be completed substantially at the same time and the United States ought to have the advantage of its share of the power of the international section without waiting until Canada may be able to sell her power from these works.

Referring to the balance sheet, which undoubtedly was included in your note to illustrate the principles of the division of costs and the work to be done by each country, I am in general accord with those princi-

ples. The amounts and some of the items would have to be considered and discussed in the negotiations. To illustrate: I am not inclined to the view that it is right to include in the balance sheet the costs of the St. Lawrence and Old Welland Canals except so far as they may be of use to the deeper system. These works are understood to be for lighter craft and of little value for the purpose of the works now proposed. These waterways are understood to have served their purpose in economic returns. It would also seem to be necessary to differentiate between the costs that may properly be chargeable to navigation and those to power in general. Those who now or in the future profit by the power should bear their share of the expense. It is understood that the power development will carry itself. To illustrate: under the suggestions you make, the United States will have no proprietary interest in the power on the national section. It would, therefore, seem that as this development is for the benefit of Canada, your Government should be responsible for that expense, and that such expense should take into account the costs to be borne by the respective interests whether the power is actually installed now or later. The amount, therefore, which power on the national section should contribute to the cost of the improvement should be left open for consideration and subject to determination in the negotiations. All power, of course, developed for joint benefit in the international section should ultimately be paid for as a part of the joint venture. The application of this principle would change the proposed balance sheet considerably. Therefore, if, as you suggest as to this section, the United States is willing to build not only the waterway but the power, it would seem that the United States ought to be permitted to develop its power and use its half, the other half to be used by Canada or not as it should desire.

The United States is agreeable to the proposal that all navigation channels provided in improvements have a minimum depth of 27 feet, the permanent structures having a depth of 30 feet for future expansion. The United States has at present under consideration the deepening of the lake channels to the extent economically justified by the present commerce of the Great Lakes. There is one question that we should like to leave for discussion and that is, whether it would be economical to at once build a new lock and

deepen the Soo Canal until such time as the St. Lawrence is nearing completion so that there would be a demand for deeper channels. It is clearly advisable that the large expenditures required for depths in excess of present needs be deferred until the greater depths can be profitably used.

The United States fully recognizes the right of the Dominion of Canada to the ownership and use of the Canadian share of the power which may be developed in the international section of the waterway as well as to all that developed in the national section and it recognizes also that the disposition of the power is purely a domestic question. It recognizes further that this share is an inherent attribute of Canadian sovereignty, irrespective of the agency by which the power may be developed.

The United States regards it a fundamental economic principle that the beneficiaries of power developed in the improvement of the International Section of the St. Lawrence should pay ultimately their fair share of the cost of its production, whether the agency constructing these works be a corporation, a state or province, or a national government. It believes that a practical means can be found for effecting the fulfillment of this principle in the arrangements made for the improvement of the international section of the river for the joint benefit of navigation and power development, and believes that the negotiations entered into in furtherance of the undertaking of the project should have this end in view.

The large expenditures required for the undertaking are a matter of grave concern to the United States as well as to Canada. It is felt that when the United States embarks on the enterprise all expenditures should be on a sound economic basis.

The United States accepts without reservation the principle that the operation of works in the International Section must be such as will control fluctuations of the outflow from Lake Ontario in such manner as to safeguard all interests on the purely Canadian sections of the river, including especially the Port of Montreal. It regards as acceptable the proposal that the design and operation of works in the International Section of the river be under joint

technical control and assumes that the design of all works on the waterway will comply in general with the plans agreed upon by the Joint Engineering Board as embodying the best principles.

The United States is fully in accord with the view that the advisability of undertaking the improvement at the present time depends on the solution of the financial and economic problems involved. It shares the hope expressed that a solution will be found which will fully safeguard the interests of the two countries and will afford an equitable basis for a division of the cost. It is confident that when these economic principles are determined, the solution of the engineering problems required for their fulfillment will be speedily realized.

I have the honour to suggest, therefore, that the two countries proceed with the appointment of commissioners to discuss jointly the problems presented in your note, and those which I have presented herein with a view to the formulation of a convention appropriate to this subject.

The Government of the United States will be glad to have this discussion extended to the further consideration of any outstanding problems affecting the Great Lakes and the St. Lawrence as suggested in your note.

Accept, sir, the renewed assurance of my highest consideration.

(Signed) Frank B. Kellogg.

The Honourable Vincent Massey,
Minister of the Dominion of Canada.

(Reprint from Canadian Records)

Can. Ref:- A Monograph entitled, "St. Lawrence waterway Project", 1928, p. 12-14.

U. S. Ref:- Congressional Record - Appendix - April 17, 1928, pp. 6938-39.

XVI. From the Minister of the Dominion of Canada,
Washington, to the Secretary of State of the
United States, Washington.

No. 64.

April 5, 1928.

Sir, - I have the honour to refer to your note of March 12, 1928, on the St. Lawrence Waterway project.

The Secretary of State for External Affairs has noted that while the United States is not in complete agreement with the representations contained in my note Number 30 of January 31, 1928, as to the relative benefits and ultimate costs to the two countries of the proposed improvement and the division of expenses to be borne by each country, it is inclined to regard as an acceptable basis of negotiation the suggestions of the National Advisory Committee summarized in my note as to the division between Canada and the United States of the tasks involved in the completion of the Deep St. Lawrence Waterway.

The Secretary of State for External Affairs has noted that the United States agrees that a channel of twenty-seven feet minimum depth would be advisable, accepts the principle that the works in the international section must be so operated as to control fluctuations of the outflow from Lake Ontario in such manner as to safeguard all interests on the purely Canadian sections, including the port of Montreal, and agrees that the design and operation of the works in the international section should be under joint technical control. It is noted also that the United States would be prepared to have the discussion extended to the consideration of any outstanding problems affecting the Great Lakes and the St. Lawrence watershed, as suggested in my previous note.

In your note under reference you raise some question as to the relative advantage of the waterway to each country and as to the validity of some of the items included on the Canadian side of the balance sheet presented for illustrative purposes by the National Advisory Committee, and refer also to the problems involved in the allocation of costs as between navigation and power. At the present stage it does not appear necessary to discuss these points in detail.

It is further noted that you do not favour the recommendation of the National Advisory Committee, which was an integral feature of its plan and of the division of tasks which it proposed, that the works on the national section should be given priority over the works on the international section in order to permit an agreed solution of the engineering difficulties in this area, and to ensure reasonable absorption of the power developed on the Canadian side. In view of the fact that the market for hydro-electric power in Canada, though large and rapidly expanding, has definite limitations, and that export of power is considered contrary to public policy, it is an essential factor in any plan economically feasible from the Canadian standpoint, that, whether through the priority procedure set out by the National Advisory Committee or by some alternative method, the development of power to be utilized in Canada should not outrun the capacity of the Canadian market to absorb and thus to meet the proportion of the costs of the waterway fairly chargeable to power.

The National Advisory Committee laid emphasis on another phase of the situation - the necessity of reconciling the divergent views of the two sections of the Joint Board of Engineers as to the best method of development in the international section of the St. Lawrence. Definite and agreed engineering proposals for the development of this section would appear to be a necessary preliminary to any computation of costs or decision as to the order of construction or division of tasks. His Majesty's Government in Canada has previously referred to the view of the National Advisory Committee, which it shares, that a conference should be held between the Canadian section of the Joint Board and engineers representing the Province of Ontario. It would appear advisable that such a conference should be followed by re-consideration of the engineering problems in the international section by the whole Joint Board.

Reference was made in my previous note to certain constitutional questions affecting the Canadian situation, and to the intention of His Majesty's Government in Canada, in accordance with the wishes of the Governments of Ontario and Quebec, to seek a solution by reference to the Courts. Steps have since been taken to this end, and it is anticipated that the reference

will come before the Supreme Court of Canada at an early date.

It was further indicated in my previous note that, with the constitutional question in process of solution, His Majesty's Government in Canada would be in a position, upon learning whether the Government of the United States considered that the procedure suggested by the National Advisory Committee formed an acceptable basis of negotiation, to consult with the Provinces of Ontario and Quebec upon the aspects of the problem with which they may be concerned. While the acceptance by the United States of this basis of negotiation is attended with important qualifications, yet the position of the Government of the United States has been made sufficiently clear and definite to permit the Government of Canada to take the necessary step thus contemplated and discuss with the provinces the aspects in question. Following this consultation, His Majesty's Government in Canada will be in a position to inform the Government of the United States further of its views on the proposals contained in your note of March 12.

I have the honour to be, with the highest consideration, sir, Your most obedient, humble servant,

(Signed) Laurent Beaudry,
(For the Minister)

The Honourable Frank B. Kellogg,
Secretary of State of the United States,
Washington, D. C.

(Reprint from Canadian Records)

Can. Ref:- A monograph entitled, "St. Lawrence Waterway Project", 1928, pp. 15-16.

U. S. Ref:- Congressional Record - Appendix - April 17, 1928, p. 6939.

XVII. From the Secretary of State of the United States, Washington, to the Minister of the Dominion of Canada, Washington

April 7, 1928.

Sir, - I have the honour to receive your note of April 5, 1928, with reference to the negotiations between the Canadian Government and the United States looking to the construction of the deep St. Lawrence waterway. I note your suggestion that the position of the United States has been made sufficiently clear and definite to permit the Government of Canada to take the necessary steps contemplated and to discuss with the provinces of Ontario and Quebec the aspects in question. I entirely agree with you that there is no reason why at this time the Government of Canada should not take up such discussion with the provinces.

I note also that His Majesty's Government of Canada suggests that it would be advisable that definite and agreed engineering proposals for the development of the International Section would appear to be necessary preliminary to any computation of costs or decision as to the order of construction or division of tasks and that a conference should be held between the Canadian section of the Joint Board and engineers representing the province of Ontario; further that it would be advisable that such a conference should be followed by reconsideration of the engineering problems in the International Section by the whole Joint Board. Of course, the Government of the United States fully realizes the desirability of the Canadian Government's consultation with the provinces and with the Canadian section of the Joint Board of Engineers. The United States section of the Joint Board will be prepared at any time to take up with the full Board and discuss and reconsider engineering problems connected with the construction of the International Section. I have the honour to suggest, however, that it would seem as though the entire subject of treaty negotiation need not be postponed until the termination of these discussions and of the reconsideration by the Joint Board of Engineers and that it might be desirable for the negotiations to go on concurrently with the examination of such engineers as their advice and assistance would be necessary. The United States will be prepared to co-operate to the fullest extent with the

Canadian Government at any time for the purpose of accomplishing the improvement contemplated.

Accept, Sir, the renewed assurance of my highest consideration.

(Signed) Frank B. Kellogg.

The Honourable Vincent Massey,
Minister of the Dominion of Canada.

(Reprint from Canadian Records)

Can. Ref:- A Monograph entitled, "St. Lawrence Waterway Project," 1928, p. 16-17.

U. S. Ref:- Congressional Record - Appendix - April 17, 1928, p. 6939.

The Minister represents, in connection therewith, that Your Excellency's advisers have not thus far had opportunity to give to the Report of the International Joint Commission and the accompanying Report of the Board of Engineers appointed to examine the subject, that careful consideration which their important duties, and that moreover, having regard to the magnitude of the project and the very large outlay of public money involved, the Government is of opinion that it would not appear to be expedient to deal with this matter at the present time.

The Minister further represents that the Canadian Government have no objection to the publication of a statement as proposed by the President to the effect that the United States Government have raised this question officially with them.

The Committee copies to the foregoing and advises that Your Excellency may be pleased to transmit the substance of this minute, by telegraph, to His Majesty's Ambassador at Washington for communication of the purpose to the United States Government.

All of which is respectfully submitted for Your Excellency's approval.

ROBERTSON BOWENMAN,
Chief of the Privy Council.

(Reprint from Canadian Records)

Can. Ref:- Sessional Papers Vol. LVIII, No. 7, (1923); Sessional Paper No. 294, p. 5.

APPENDIX B

I. ORDER IN COUNCIL AUTHORIZING HIS EXCELLENCY TO TRANSMIT TO THE UNITED STATES GOVERNMENT THE VIEWS OF THE GOVERNMENT OF CANADA

P.C. 1142

Certified copy of a Report of the Committee of the Privy Council, approved by His Excellency the Governor General on the 29th May, 1922.

The Committee of the Privy Council have had before them a report, dated 26th May, 1922, from the Honourable the Secretary of State for External Affairs, to whom was referred a despatch, dated 18th May, 1922, from His Majesty's Ambassador at Washington, transmitting a copy of a note dated 17th May from the United States Secretary of State to the effect that the President of the United States favours the negotiations of a treaty to be framed on the basis of the Report of the International Joint Commission on the subject of the improvement of the St. Lawrence river between lake Ontario and Montreal for navigation and for the development of water power.

The Minister represents, in connection therewith, that Your Excellency's advisers have not thus far had opportunity to give to the Report of the International Joint Commission and the accompanying Report of the Board of Engineers appointed to examine the subject, that careful consideration which their importance merits, and that moreover, having regard to the magnitude of the project and the very large outlay of public money involved, the Government is of opinion that it would not appear to be expedient to deal with this matter at the present time.

The Minister further represents that the Canadian Government have no objection to the publication of a statement as proposed by the President to the effect that the United States Government have raised this question officially with them.

The Committee concur in the foregoing and advise that Your Excellency may be pleased to transmit the substance of this minute, by telegraph, to His Majesty's Ambassador at Washington for communication of its purport to the United States Government.

All of which is respectfully submitted for Your Excellency's approval.

RODOLPHE BOUDREAU,
Clerk of the Privy Council.

(Reprint from Canadian Records)

Can. Ref.:— Sessional Papers Vol. LVIII, No. 9, (1922); Sessional Paper No. 89a, p. 6.

II. ORDER IN COUNCIL FOR THE CREATION OF AN INTER-
GOVERNMENTAL COMMITTEE

Certified copy of a minute of a meeting of the Committee of the Privy Council, approved by His Excellency the Governor General, on 10th of March, 1924.

P.C. 386

The Committee of the Privy Council have had before them a report, dated 6th March, 1924, from the Secretary of State for External Affairs, submitting that the problems presented by the proposal to develop the St. Lawrence Waterway are of such variety and complication that it would be useful to provide for the co-ordination of the views of the technical officers of the several departments of Government whose work may be affected by the initiation of negotiations leading to the conclusions of a treaty with the United States of America on the subject, or by the carrying out of the work, if it is undertaken.

The Minister accordingly recommends that there be constituted a committee including one representative from each of the following departments, viz., the Departments of Finance, Public Works, Marine and Fisheries, Interior, Railways and Canals, and Trade and Commerce such representatives to be selected by the Ministers of the said Departments respectively, who may each of them appoint an alternate member to act in the absence of his principal nominee, and that Colonel Biggar, Government Counsel, be appointed Chairman of such committee.

The Minister further recommends that the Committee be directed to bring to his attention such technical aspects of the problems presented by the proposal as in its opinion may require consideration either in determining whether or not negotiations looking to the conclusion of a treaty should be entered into, or, in the course of any such negotiations as may be initiated, and also to report especially upon any matter relating to the proposed waterway which may be referred to it by any Minister of the Crown or by the Canadian section of the Joint Engineering Board, the enlargement of which has already been agreed upon. Each member of the Committee shall keep his Minister informed of its proceedings and conclusions.

The Committee concur in the foregoing and submit the same for Your Excellency's approval.

(signed) E. J. Lemaire,
Clerk of the Privy Council

The Honourable, the Minister of the Interior.

(Reprint from Canadian Records)

III. ORDER IN COUNCIL CREATING THE CANADIAN SECTION OF
THE JOINT BOARD OF ENGINEERS

Certified copy of a report of the Committee of the
Privy Council appointed by His Excellency
the Governor General on the 7th May, 1924

P.C. 778

The Committee of the Privy Council, on the recommendation of the Secretary of State for External Affairs, advise that Duncan W. McLachlan, B. Sc., of the Departments of Railways and Canals, Ottawa; Olivier Odilon Lefebvre, Chief Engineer, Quebec Streams Commission, of Montreal, and Brig.-General Charles Hamilton Mitchell, C.B., C.M.G., B.A.Sc., C.E., of Toronto, be appointed to act with three engineers nominated by the Government of the United States of America as a Joint Board of Engineers to examine further into such matters relating to the improvement of the St. Lawrence Waterway as may be referred to such Board by agreement between the Government of Canada and the Government of the United States, and to report upon the matters referred to the Board within such time as may be limited by the specific instructions agreed on as aforesaid.

The Committee, on the same recommendation, further advise that the two engineers last above named be appointed to consult with two technical officers selected by the Government of the United States as to the subjects of investigation which should be specifically referred to the Board, and to submit their recommendations as to the form and contents of such specific instructions.

All of which is respectfully submitted for Your Excellency's approval.

(signed) E. J. Lemaire
Clerk of the Privy Council

(Reprint from Canadian Records)

Can. Ref.: - 14th Parliament, 3rd Session, Sessional Papers
Vol. LX, No. 7 (1924). Sessional Paper No. 101g,
p. 99.

IV. ORDER IN COUNCIL CREATING THE NATIONAL ADVISORY COMMITTEE OF CANADA

Certified copy of a report of the Committee of the
Privy Council approved by His Excellency the
Governor General on the 7th May, 1924

P.C. 779

The Committee of the Privy Council have had before them a Report, date 7th May, 1924, from the Secretary of State for External Affairs, submitting that the question of improving the navigation on the St. Lawrence Waterway so as to provide access to the Great Lakes for maritime commerce, is one of considerable difficulty and complication, and its right decision may be of the highest possible importance to Canada. The project necessarily involves collaboration with the United States of America and the expenditure of very large sums of money. The minutest examination of the problems in all its aspects, financial, economic, technical, and international, is not only justified but essential. The International Joint Commission has held hearings on the subject in both Canada and the United States, and has submitted a most elaborate and valuable report; the engineering problems involved already have been the subject of enquiry and report by an international board of engineers, and are to be further investigated by another such Board; other technical connected questions are in course of being studied by an inter-departmental committee.

The Minister is of the opinion that it would be in the public interest to constitute a national advisory committee to consider generally whether or not the project would, if completed, be beneficial to Canada, whether the benefits which might accrue and which may be anticipated from it are such as to counterbalance its disadvantages, if any, whether Your Excellency should indicate a readiness to enter into discussions with the United States of America looking towards the negotiation of a treaty for the carrying out of the necessary works, and what should be the character of the stipulations which any such treaty should contain.

The Minister accordingly recommends that a National Advisory Committee be constituted for the purpose aforesaid, the Honourable George Perry Graham,

Minister of Railways and Canals, to be Chairman thereof, and the following to be its members:-

Thomas Ahearn, Ottawa, Ont.,
Hon. Walter Edward Foster, St. John, N.B.,
Beaudry Lehman, B.Sc., C.E., Montreal, P.Q.,
Edward D. Martin, Winnipeg, Man.,
Dr. Wilfrid Laurier McDougall, Montreal, P.Q.,
Hon. Sir Clifford Sifton, K.C.M.G., K.C.,
Toronto, Ont.,
Major-General John Wm. Stewart, C.B., C.M.G.,
Vancouver, N.C.,
Hon. Adelard Turgeon, C.M.G., C.V.O.,
Quebec, P.Q.

The Committee concur in the foregoing recommendation and submit the same for approval.

(Signed) E. J. Lemaire,
Clerk of Privy Council

(Reprint from Canadian Records)

Can. Ref.: - 14th Parliament, 3rd Session, Sessional
Papers Vol. LX, No. 7 (1924). Sessional
Paper No. 101f, p. 97.

V. ORDER IN COUNCIL REFERRING TO THE SUPREME COURT
OF CANADA CERTAIN QUESTIONS AS TO WATER
POWER RIGHTS OF THE DOMINION AND
THE PROVINCES

P.C. 115

Certified copy of a report of the Committee of the
Privy Council approved by His Excellency the
Governor General on the 18th January, 1928

The Committee of the Privy Council have had before them a report, dated 17th January, 1928, from the Minister of Justice, submitting that at the Dominion-Provincial Conference, held at Ottawa in the month of November, 1927, the Premiers of certain of the provinces questioned the right of the Dominion to dispose of water powers brought into being by the erection of Dominion works for the improvement of navigation, and asserted a right on the part of the provinces to dispose of any such water powers within the limits of the province; and

That in the discussion which followed regarding this claim, and also with regard to the whole question of the division of legislative control over and proprietary interest in water powers, it was found impossible to reach any general agreement as between the Dominion and the provinces, and in the result a request was made by the Premiers of Ontario and Quebec that the Dominion undertake to refer the whole matter to the Supreme Court of Canada for hearing and consideration.

The Committee, therefore, on the recommendation of the Minister of Justice, advise that, pursuant to the powers in that behalf conferred by section 60 of the Supreme Court Act, Your Excellency may be pleased to refer to the Supreme Court of Canada for hearing and consideration the following questions:

1. Has the province any proprietary interest in flowing waters within the province, and, if so, what is the nature of such interest?
2. Does the ownership by the province of the bed of any stream, whether such bed be level or sloping, give to the province the ownership of water powers:
 - (a) created thereupon by Dominion works for the improvement of navigation; or
 - (b) existing thereupon by nature?
3. Has the province any proprietary interest in or legislative control over:

- (a) the canals, with lands and water power connected therewith, and the lake and river improvements which were conveyed to the Dominion by section 108, Schedule 3, of the British North America Act, 1867, or in or over the disposal of any water powers created thereby or existing thereupon from time to time; or
- (b) water powers created by works for the improvement of navigation constructed by or under the authority of the Dominion since Confederation; or
- (c) works constructed wholly for power purposes by the Dominion out of moneys appropriated by Parliament for such purpose?

If so, what is the nature of such interest or control?

4. Has the Dominion exclusive legislative power to regulate waters for the purposes of navigation:

- (a) in navigable waters; and
- (b) in non-navigable waters?

5. Where the Dominion, for navigation purposes, expropriates or uses any part of the bed of any stream vested in the province, is the province entitled to any compensation for such expropriation or use?

6. Has the Dominion the exclusive legislative control over and proprietary interest in water powers brought into being by works authorized by Parliament to be erected in an international stream for the purpose of carrying out an agreement between Canada and any foreign country looking to the erection of joint works for the improvement of navigation in such stream?

If not, what are the powers and rights of the province with regard to such water powers?

7. Where the bed of a navigable stream is owned by the province or by a private individual, is the title of such owner subordinate to the public right of navigation, and to the provisions of any statute which may be enacted from time to time by Parliament, within the powers conferred by section 91 (10) of the British North America Act, 1867?

E. J. LEMAIRE,
Clerk of the Privy Council.

Can. Ref.: - A Monograph entitled "St. Lawrence Waterway Project," pp. 28-29.

VI. ORDER IN COUNCIL RESCINDING AND REPLACING
P.C. 115

P.C. 592

Certified copy of a report of the Committee of the Privy Council approved by the Deputy of His Excellency the Governor General on the 14th April, 1928.

The Committee of the Privy Council have had before them a report, dated 13th April, 1928, from the Minister of Justice, submitting that at the conference of representatives of the Dominion and Provincial Governments held at Ottawa in the month of November, 1927, the Premiers of certain of the Provinces questioned the right of the Dominion to water-powers created or made available by the erection of Dominion works for the improvement of navigation and asserted a right on the part of the Provinces to such water-powers within the limits of the Province.

The Minister observes that in the discussion which followed with regard to this claim and also with regard to the whole question of the division of legislative control over and proprietary interest in water powers it was found impossible to reach any general agreement as between the Dominion and the Provinces, and in the result a request was made by the Premiers of Ontario and Quebec that the Dominion undertake to submit a case to the Supreme Court of Canada for hearing and consideration.

In pursuance of this request Your Excellency was pleased by Order in Council of the 18th January, 1928 (P.C. 115), passed on the recommendation of the Minister of Justice, to refer certain questions to the Supreme Court of Canada for hearing and consideration pursuant to section 60 of the Supreme Court Act.

The Minister states that the statistics show that the inland water-borne commerce of the Dominion has attained to great dimensions and with the growth and settlement of the country will involve large future expenditures for improvements of the extensive waterways comprising the inland navigation of the Dominion.

The Minister submits that owing to the great importance of the questions in controversy, it was considered advisable to consult with representatives of the Provinces with respect to the questions to be submitted, and such conference having been

held it was deemed advisable to revise the said questions and to submit additional questions, viz., Nos. 8 and 9 hereinafter set out at the request of representatives of the Province of Ontario.

The Minister accordingly recommends that Order in Council of the 18th January, 1928 (P.C. 115), be rescinded, and that, pursuant to the powers in that behalf conferred by section 60 of the Supreme Court Act, Your Excellency may be pleased to refer to the Supreme Court of Canada for hearing and consideration of the following questions:-

1. (a) Where the bed of a navigable river is vested in the Crown in the right of the Province, is the title subordinate to the public right of navigation?
(b) If not, has the Dominion the legislative power to declare that such title is subordinate to such right?
2. Where the bed of a navigable river is vested in the Crown in the right of the province, has the Dominion power, for navigation purposes, to use or occupy part of such bed or to divert, diminish, or change the flow over such bed
(a) without the consent of the province;
(b) without compensation?
3. Has the Parliament of Canada the power, by appropriate legislative enactment, to authorize the Dominion Government to expropriate the lands of the Crown in the right of the province for the purposes of navigation with provision or without provision for compensation?
4. By section 108 of the British North America Act, 1867, and the first item of the Third Schedule thereto, the following public works and property of each province, amongst others, shall be the property of Canada, namely "Canals with lands and water power connected there."

Has the province any proprietary interest in or beneficial ownership of or legislative control over the water power which, though connected with the said canals, is created or made available by reason of extensions, enlargements or replacements of said canals made by the Dominion since Confederation and which is not required from time to time for the purposes of navigation? If so, what is the nature or extent of such interest or ownership or control?

5. Where the bed of a navigable river is vested in the Crown in the right of the province, has the province any proprietary interest in or beneficial ownership of or legislative control over the water-power created or made available by works for the improvement of navigation constructed thereupon in whole or in part by or under the authority of the Dominion since Confederation which is not required from time to time for the purposes of navigation? If so, what is the nature or extent of such interest, ownership or control?
6. (a) Has the Dominion the exclusive proprietary interest in or beneficial ownership of or legislative control over water-powers created or made available by works authorized by Parliament to be erected in any boundary waters for the purpose of carrying out a treaty between His Majesty and a foreign country providing for the erection of joint works for (i) the improvement of navigation in such waters, or (ii) for the development of power, or (iii) for both?

The expression "boundary waters" in this question means the waters defined by the preliminary article of the Treaty dated January 11, 1909, between His Britannic Majesty and the United States of America.
- (b) If the Dominion has not the exclusive proprietary interest in or beneficial ownership of or legislative control over such water powers, has the province the exclusive proprietary interest in or beneficial ownership of or legislative control over such water powers?
- (c) If neither the Dominion nor the province has the exclusive proprietary interest in or beneficial ownership of or legislative control over such water-powers, what are their respective rights and interests in relation to such water-powers?
7. Has the Parliament of Canada legislative power to authorize the construction and operation by the Dominion Government of works wholly for power purposes and the acquisition by purchase or expropriation of the lands and property required for the purposes of such works including lands of the Crown in the right of a province

- (a) in interprovincial rivers; and
- (b) in provincial rivers?

"Interprovincial rivers" in this question means rivers flowing along or across the boundaries between provinces.

- 8. May a province notwithstanding the construction by the Dominion for the purposes of navigation of works in a river the bed of which is within such province, control, regulate and use the waters in such river so long as such control, regulation and use does not interfere with navigation? In the case of a river flowing between two provinces may such provinces jointly control, regulate and use the water in the same manner?
- 9. Has a province the right to control or use the waters in provincial rivers and to develop or authorize the development of water-powers within the province provided that in so doing navigation is not prejudiced and that the province complies with Dominion requirements as to navigation?

The Committee concur in the foregoing and advise that Your Excellency may be pleased to refer the said questions to the Supreme Court of Canada for hearing and consideration, accordingly.

(Sgd.) E. J. LEMAIRE,
Clerk of the Privy Council.

Can. Ref.:— A monograph entitled "St. Lawrence Waterway Project," pp. 30-32.

APPENDIX C

SOME EARLY STATUTE LAWS OF LOWER CANADA RELATIVE TO THE IMPROVEMENT OF NAVIGATION ON THE ST. LAWRENCE

- I. An ACT to grant an Aid to His Majesty, to assist in opening a Canal from the neighborhood of Montreal to La Chine, and further to provide for facilitating execution of the same

MOST GRACIOUS SOVEREIGN

25th March, 1815.

- I. (Preamble. £25,000 granted for opening a Canal from the neighborhood of Montreal to La Chine.)

Whereas by a Message from the Governor in Chief to the House of Assembly, bearing date the third day of February, one thousand eight hundred and fifteen, setting forth, that "His Majesty's Government having in contemplation the speedy opening of a Canal from the neighborhood of the Town of Montreal to La Chine, His Excellency the Governor in Chief recommends the subject to the early consideration of the House of Assembly, and that they will grant such supply and other Legislative provision as they may deem expedient to assist in carrying into execution so important an object," and whereas the execution of such a project will greatly benefit Your Majesty's service, ameliorate the Internal Communications of this Province, and thereby tend generally to the encouragement of the agriculture and commerce thereof; May it therefore please Your Majesty that it may be enacted and be it enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Assembly of the Province of Lower Canada, constituted and assembled by virtue of and under the authority of an Act passed in the Parliament of Great Britain, intituled, "An Act to repeal certain parts of an Act passed in the fourteenth year of His Majesty's Reign, intituled, 'An Act for making more effectual provision for the Government of the Province of Quebec, in North America;' And to make further provision for the Government of the said Province." And it is hereby enacted by the authority of the same, that the sum of twenty-five thousand pounds, currency, to be taken out of any of the unappropriated monies which now are or shall at any time hereafter be, in the hands of the Receiver General of this Province, be

granted and the same is hereby granted to His Majesty, His Heirs, and Successors to assist in carrying into execution the said Canal.

II. (Governor empowered to appoint Commissioners, for the purposes of this Act. Commissioners to pay all the monies they may receive by virtue of this Act to the Receiver General. For which the Receiver General shall account to His Majesty. No portion of the sum of £25,000 to be paid until the Canal is in the course of actual execution.)

And whereas it is expedient to make further provision for facilitating the tracing out, executing and maintaining the said projected Canal, be it further enacted by the authority aforesaid, that it shall and may be lawful to and for the Governor, Lieutenant Governor, or person administering the Government of this Province, for the time being, by an Instrument under the Great Seal of this Province, to constitute and appoint such and so many persons as he shall think fit, to be Commissioners, and a Secretary to carry into execution or superintend the works necessary to the making, repairing and improving of the said Canal and to administer, collect and apply the monies arising from the toll thereon with power to remove, from time to time, the said Commissioners or any of them, and to appoint others in their stead, or in the stead of such as shall, from time to time, die or resign. Provided always, that the said Commissioners, from time to time, shall pay or cause to be paid into the hands of the Receiver General of this Province for the time being, all the monies which shall come into their hands in virtue of this Act immediately upon receipt thereof, any order to the application of the said monies under the direction of the said Commissioners with the sanction of the Governor, Lieutenant Governor, or person administering the Government of this Province for the time being, by Warrant under his hand and seal, to and for the purposes of this Act. And the said Receiver General is hereby required to receive the said monies and to account for the same to His Majesty, His Heirs and Successors through the Lords Commissioners of His Majesty's Treasury for the time being, in the same manner as he at present receives and accounts for other public monies. Provided always that no portion of the said sum of twenty-five thousand pounds, currency, shall be employed for the purposes of this Act, until the said Canal shall be in a course of actual execution in consequence of the

orders of His Majesty, His Heirs, and Successors, to that effect.

III. (Commissioners declared a body corporate and politic. Perpetual succession. Common Seal.)

And be it further enacted by the authority aforesaid, that the said Commissioners and their successors shall be and are hereby declared to be body corporate and Politic in name and in deed, and by the name of, Board of Administration of the Royal Canal of Canada, and under that name, shall have perpetual succession and a common Seal, with power to change, alter, break and make new same, when and as often as they shall judge the same to be expedient, and they and their successors by the same name, shall or may do all and whatsoever any Body corporate or politic, may or can legally do; and that in every suit or action to be instituted against the said corporation, service of the summons made upon the secretary thereto, personally or at his Domicile, shall be taken and held to be a legal service upon and against the said corporation, and shall sue and be sued, implead and be impleaded, answer and be answered, in all or any Court or Courts of record or Judicature within this Province, and under that name, shall exercise all the rights hereby given to them, and perform all the duties hereby imposed on them.

IV. (Commissioners impowered to make and maintain a navigable Canal from the St. Lawrence near Montreal to the waters of that river, at La Chine.)

And be it further enacted by the authority aforesaid, that the said Commissioners or majority of them, shall be authorized and impowered, and they are hereby authorized and impowered, to open or cause to be opened, make or cause to be made, complete and maintain or cause to be completed and maintained, a navigable Canal, from the waters of the St. Lawrence at or near the City of Montreal, to the waters of the said River at La Chine; the locks whereof shall not be less than fifteen feet in breadth, and which Canal shall be navigable for Vessels drawing five feet of water; to trace out and complete, or cause to be traced out and completed the same, in the line and direction which shall be most convenient and practicable for the execution of the said undertaking; and to that end shall have

power and authority to purchase lands for the use of the said Canal without incurring any of the Penalties, forfeitures or disabilities created by the Laws of mortmain; to supply the said Canal whilst the same shall be making, and when made, with water from said River St. Lawrence and from all such Brooks, Springs, Streams and water-courses, as shall be formed in making the said Canal or within the distance of one thousand yards from any part of the said Canal or from any reservoir or reservoirs to be made for supplying the said Canal with water; and to make one or more reservoirs if the same shall be necessary for the purpose of supplying the said Canal with Water, and such and so many feeders and aqueducts for supplying the said reservoirs with water, as to them shall seem necessary and proper. And for the purposes aforesaid, they are hereby authorized to enter into and upon the lands or grounds of or belonging to any person or persons, community, Body Politic or Corporation whatsoever, (not being within three months after the passing of this Act, the ground whereon a house shall be erected, unless with the consent of the owners and occupiers thereof, respectively,) and to survey and take levels of the same or any part thereof, and to set out and ascertain such parts thereof as they shall think necessary and proper for making the said Canal, and all such other matters and conveniences as they shall think necessary and proper for making, effecting, preserving, improving, completing and using the said intended Canal; and also to pare, dig, cut, trench, remove, take, carry away and lay Earth, Soil, Clay, Stone, Rubbish, Trees, beds of Gravel or Sand, or any other matters or things which may be dug or got in the making of the said Canal or reservoirs, tunnels or aqueduct, or aqueducts, or out of any lands of any person or persons contiguous thereto, and which may be proper, requisite or convenient for carrying on, continuing and repairing the said Canal or reservoirs, or which may hinder, prevent, or obstruct the making, using, completing and maintaining the same, and also to make, build, erect, and set up, in or upon the said intended Canal, or upon the lands adjoining or near to the same, such, and as many Bridges, tunnels, aqueducts, sluices, locks, weirs, tanks, reservoirs, drains, wharves, quays, landing places, weigh-beams, cranes and other works, ways, roads and conveniences, as shall be deemed requisite and convenient for the purpose of the said canal; and also, from time to time, to alter, repair, amend

widen, and enlarge the same or any other of the conveniences above mentioned, as well for the carrying or conveying Goods, Commodities and other things to or from the said Canal as for the carrying or conveying of all materials necessary for the making, altering, repairing, amending, widening, or enlarging the works of and belonging to the said Canal, and also to place, lay, work and manufacture the said Materials on the grounds near to the place or places where the said works, or any of them shall be intended to be made, erected, repaired or done; and also to make, maintain, repair and alter any Fences or Passages over, under, or through the said Canal, or the Reservoirs, Funnels, Aqueducts, Trenches, Gutters, water-courses, Drains and Sluices, respectively, which shall communicate therewith; and also to make, set up and appoint such Roads, Towing-Paths, Banks and Ways convenient for towing, hauling or drawing of Boats, Barges, or other Vessels, passing in, through or upon the said Canal as shall be deemed necessary, and to contract, erect, and keep in repairs any Piers, Arches or other works, in, upon and across any Rivers or Brooks, for making, using, maintaining, and repairing the said Canal, and the Towing-Paths over the sides thereof, doing as little damage as possible in the execution of the several powers hereby granted, and making satisfaction in manner hereinafter mentioned for all damages to be sustained by the Owners or Proprietors of such lands or grounds, Rivers, Waters, Water-courses, or Brooks respectively as shall be taken, used, removed, diverted or prejudiced in or by the execution of all or any of the power granted by this Act.

V. (Extent of the land ground that may be taken for the Canal, &c.)

Provided always, and be it further enacted by the authority aforesaid, that the land and ground to be taken or used for such Canal and towing-paths, and the Ditches, Drains and Fences to separate such Towing-Paths from the adjoining lands, shall not exceed twenty-six yards in breadth, except in such places where the said Canal shall be raised higher, or cut more than five feet deeper than the present surface of the soil; and in such places, where it shall be judged necessary for boats and other vessels to turn, lie or pass each other, nor more than sixty yards in any of those places, nor shall any land or ground, so set out and ascertained for the purpose of making the said Canal and Reservoirs, be applied to the said purposes, without the consent of the owner

or owners of the said Lands, respectively, under his or their hands in writing first had and obtained, unless the same shall be valued and paid for in manner as hereinafter mentioned.

VI. (When necessary to cut into any highway, to conduct the canal, a bridge to be built for passing of carriages.)

VII. (Commissioners impowered to break down public Bridges and to erect other Bridges in lieu of those taken down.)

VIII. (When the Canal passes within the line or across the Land of any Individual, so as to intercept the communication between the land and any Highway or Street, Commissioners to build Bridges.)

IX. (Individuals in certain cases, may build new Bridges over the Canal.)

X. (Bodies politic and other Persons allowed to sell and convey to the Commissioners, certain parts of their Land, set out for the use of the Canal.)

XI. (Bodies politic, who may be restrained by Law from selling their land, may receive an equivalent, by affixed annual rent.)

XII. (Questions arising between the Commissioners and Proprietors, respecting Lands, that may be taken for the Canal, how to be settled.)

XIII. (In Cases of Verdicts, expenses of summoning and of taking the Inquest, as well as the costs and expenses, how to be settled, and by whom to be borne.)

XIV. (Limitation of all complaints respecting damages or inquiry sustained.)

XV. (Persons intitled to receive a sum of money or annual rent, for lands taken for the Canal not appearing or refusing to receive the same or the amount vested in the Commissioners.)

XVI. (Agreements & determinations by Arbitrations and verdicts and judgment by the Clerk of the Court of the District of Montreal among the records of the court.)

XVII. (Penalty on persons destroying any Banks or other works of the Canal.)

XIX. (Canal declared free for certain dimensions of vessels, paying certain rates for wharfage. The Rates.)

And be it further enacted by the authority aforesaid, that the said Canal, shall be free for all persons whomsoever, who are hereby authorized and impowered to navigate freely upon the same, with any Boat, Barge, or other vessel, and to use the said towing-paths for hauling and drawing Boats, Barges and other vessels, and also to use the said wharves for loading and unloading any goods, wares and merchandize, under such conditions and regulations, and upon payment of such rates and dues, as shall or may hereafter, be enacted by an Act of the Legislature of this Province of Lower Canada, so soon as adequate information, touching the Premises shall be obtained from the Commissioners to be appointed, as aforesaid.

XX. (In Cases of unexpected accidents to the locks &c. the same how to be repaired.)

XXI. (Nothing in this Act to prevent persons, through whose land the Canal may pass, to make or use any wharves upon their own Land, &c.)

XXII. (Fines and penalties to be paid to the Treasurer, to be disposed of, for the use of the Canal.)

XXIII. (Limitation of Actions. General issue. Treble Costs.)

XXIV. (Not to affect His Majesty's Right, &c.)

XXV. (Public Act.)

XXVI. (Commissioners to cause a detailed plan to be made of the intended Canal and its dependencies with Statements and estimates of the works to be deposited in the office of the clerk of the peace at Montreal.)

And in order to the obtaining for the Commissioners hereby appointed for the making of the said Canal, more ample information, be it therefore enacted by the authority aforesaid, that the said Commissioners, before

causing the works upon the said Canal to be commenced shall cause to be made a detailed plan of the intended Canal, and of its dependencies, with statements and estimates of the works necessary to the making thereof, and shall deposit the said plan and the said statements and estimates in the office of the Peace for the District of Montreal, during one Month, and shall give notice in the Quebec Gazette and in some one of the public Papers for the District of Montreal of the making of such deposit, and that they will receive all such information for the advantage of the said Canal, as it shall be desired to communicate to them.

Volume the Eighth Chapter XX 25th March, 1815

Whereas it is expedient to adopt effectual measures for opening a Navigable Canal from the neighborhood of Montreal to Lacine, in the event that the Company of Proprietors by law incorporated, shall not make and complete the same within the period prescribed by an Act passed by the Legislature of this Province in the fifty-ninth year of the reign of His late Majesty George the Third, Chapter sixth, or shall have lost their right so to do, or not fulfilling the conditions which are imposed on them by the said Act or shall have abandoned their right to make such canal pursuant to such Act; as is therefore enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Assembly of the Province of Lower Canada, constituted and assembled by virtue of and under the authority of an Act passed in the Parliament of Great Britain, intitled, "An Act to repeal certain parts of an Act passed in the fourteenth year of His Majesty's reign, intitled, 'An Act for making more effectual provision for the Government of the Province of Quebec in North America,' and to make further provision for the Government of the said Province," and it is hereby enacted by the authority of the same, that in case the Company of Proprietors incorporated by the above-mentioned Act passed in the fifty-ninth year of His late Majesty's reign, for the purpose of making and maintaining a navigable Canal from the neighborhood of the City of Montreal to the Parish of Lacine in the Island and County of Montreal, shall not make and complete the same within the time by law prescribed, or

II. An Act for making a Navigable Canal, from the neighborhood of Montreal to the Parish of Lachine, and to appropriate a certain sum of money for that purpose, and to repeal a certain Act therein mentioned.

17th March, 1821.

I. (Preamble. In case the Company of Proprietors incorporated by the Act 59, Geo. III, Cap. 6, shall not complete a navigable Canal from Montreal to Lachine, within the time prescribed by that Act, then the sum of £25,000 granted by Act 55, Geo. III, Cap. 20, and a further sum of £10,000 granted under Act 59, Geo. III, Cap. 6, shall be appropriated to the completing of the said Canal.)

Whereas it is expedient to adopt effectual measures for opening a Navigable Canal from the neighborhood of Montreal to Lachine, in the event that the company of Proprietors by law thereunto authorized, shall not make and complete the same within the period prescribed by an Act passed by the Legislature of this Province in the fifty-ninth year of the Reign of His late Majesty George the Third, Chapter sixth, or shall have lost their right so to do, by not fulfilling the conditions which are imposed on them by the said Act or shall have abandoned their right to make such Canal pursuant to such Act; be it therefore enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Assembly of the Province of Lower Canada, constituted and assembled by virtue of and under the authority of an Act passed in the Parliament of Great Britain, intituled, "An Act to repeal certain parts of an Act passed in the fourteenth year of His Majesty's Reign, intituled, 'An Act for making more effectual provision for the Government of the Province of Quebec in North America,' and to make further provision for the Government of the said Province," and it is hereby enacted by the authority of the same, that in case the Company of Proprietors incorporated by the above-mentioned Act passed in the fifty-ninth year of His late Majesty's Reign, for the purpose of making and maintaining a navigable Canal, from the neighborhood of the City of Montreal to the Parish of Lachine in the Island and County of Montreal, shall not make and complete the same within the time by law prescribed, or

shall have lost or shall relinquish their right so to do, the sum of twenty-five thousand pounds, currency, heretofore appropriated by an Act of the Legislature of this Province, passed in the fifty-fifth year of His late Majesty's Reign, intituled, "An Act to grant an aid to His Majesty, to assist in opening a Canal from the neighborhood of Montreal to Lachine, and further to provide for the execution of the same;" and the further sum of ten thousand pounds, appropriated by the third section of the above-mentioned Act passed in the fifty-ninth year of His late Majesty's Reign, towards the above-mentioned Canal, intended to be made by the said Company shall be, and the same is hereby appropriated for the purpose of making a Canal from the neighborhood of Montreal to Lachine, aforesaid, as hereinafter it is directed.

II. (Commander of the forces subscribing £10,000 towards the Canal in addition to the sum appropriated, King's boats to pass the Canal free of Toll.)

And be it further enacted by the authority aforesaid, that if the Commander of His Majesty's Forces in this Province, shall, on the part of His Majesty's Government, contribute and pay a sum of ten thousand pounds, currency, or more towards the making the said Canal, in addition to the sums hereinabove appropriated, all boats, batteaux, lighters or vessels, laden with warlike or other stores, belonging to His Majesty, his Heirs and Successors, shall and may at all times pass and repass through the said intended Canal, without paying any toll or duty whatsoever.

III. (Governor impowered to appoint Commissioners, and Secretary for the purposes of this Act.)

And be it further enacted by the authority aforesaid, that it shall and may be lawful to and for the Governor, Lieutenant Governor or person administering the Government of the Province for the time being, by an instrument under the Great Seal of the Province, to constitute and appoint such and so many persons as he shall think fit, to be Commissioners, and a Secretary to carry into execution and superintend the works necessary to make the said Canal, with power, to remove from time to time, the said Commissioners and Secretary, and to appoint others in their stead, or in the stead of such as may, from time to time, die or resign.

IV. (Commissioners declared a body corporate.)

V. (Commissioners impowered to make and maintain a navigable Canal from the St. Lawrence near Montreal to the waters of that river at Lachine.)

And be it further enacted by the authority aforesaid, that the said Commissioners or a majority of them, shall be, and they are hereby authorized and empowered to cause to be opened, made and completed, a navigable Canal, the Locks of which shall not be less than twenty feet in width, and not more than one hundred feet in length, or not less than forty feet at the surface of the water, and twenty-eight feet at the bottom, and navigable for boats, batteaux or vessels drawing four and a half feet of water, from the neighborhood of Montreal to the Parish of Lachine, in the line and direction which shall be most convenient and practicable for the said undertaking; Granted by this Act.

XXV. (Commissioners empowered to take a part of the money for clearing the navigation of the shore of the St. Lawrence practicable for boats ascending the River, to enable them to pass through the Canal, from the Cross to the entrance of the Canal.)

And be it further enacted by the authority aforesaid that with a part of the monies by this Act appropriated, the said Commissioners shall cause the navigation of the shore of the Saint Lawrence to be cleared and rendered easy and practicable for the navigation of boats, batteaux and small vessels ascending the river intended to pass into and through the said Canal, from the foot of the current, below Montreal, or place commonly called, the Cross, to the mouth or entrance of the said Canal, in the neighborhood of Montreal.

XXVI. (Act. 55, Geo. III. Chapter 20, repealed.)

And be it further enacted by the authority aforesaid, that the above-mentioned Act, passed in the fifty-fifth year of the Reign of His late Majesty George the Third, intituled, "An Act to grant an aid to His Majesty, to assist in opening a Canal from the neighborhood of Montreal to Lachine, and further to provide for facilitating the same," shall be and the same is hereby repealed.

III. An Act to appropriate a certain sum of money therein-mentioned, towards continuing and completing the Lachine Canal.

MOST GRACIOUS SOVEREIGN

22nd March, 1823

I. (Preamble. A further sum of £12,000 granted for continuing and completing the Lachine Canal.)

Whereas it is expedient to appropriate a further sum of money for the purpose of continuing and completing the Lachine Canal; May it therefore please Your Majesty that it may be enacted, and be it enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Assembly of the Province of Lower Canada, constituted and assembled by virtue of and under the authority of an Act passed in the Parliament of Great Britain, intituled, "An Act to repeal certain parts of an Act passed in the fourteenth year of His Majesty's Reign, intituled, 'An Act for making more effectual provision for the Government of the Province of Quebec in North America,' and to make further provision for the Government of the said Province;" and it is hereby enacted by the authority of the same, that from and after the passing of this Act, it shall be lawful for the Governor, Lieutenant Governor, or persons administering the Government of the Province for the time being, by a Warrant or Warrants, under his hand, to advance and pay out of any appropriated monies, in the hands of the Receiver-General of the Province, for the time being, a sum of money not exceeding twelve thousand pounds, currency, in the course of the year one thousand, eight hundred and twenty-three, towards continuing and completing the Canal actually in progress, between the Parish of Lachine and the neighborhood of the City of Montreal, in virtue of an Act of the Legislature of this Province, of the fifth year of His Majesty's Reign, Chapter Sixth.

II. (The line already adopted by the Commissioners to be the line on which the Canal shall be made.)

And be it further enacted by the authority aforesaid, that the line or course adopted by the Commissioners appointed under the aforesaid Act, passed in the fifth year of His Majesty's Reign, as the line proper and most practicable for the aforesaid Lachine Canal, shall be the line or course upon which the said Canal shall be made and completed.

III. (Commissioners to take the necessary measures for ascertaining the value of the ground through which the Canal would pass, if the same should be continued through the city of Montreal to the current of St. Mary and to report the same to the Legislature.)

And be it further enacted by the authority aforesaid, that the aforesaid Commissioners shall take the necessary measures to ascertain the value of the ground through which the aforesaid Canal would pass, if the same were continued through the City of Montreal, to the Current St. Mary, and report the same in the English and French Languages, to the three branches of the Legislature, at the next Session, in the course of fifteen days after the opening of the same, with such other information relating to the subject, as they shall deem expedient.

IV. (Expenditure of the money to be accounted for to His Majesty.)

And be it further enacted by the authority aforesaid, that the due application of the monies appropriated in virtue of this Act, shall be accounted for to His Majesty, His Heirs and Successors, through the Lords Commissioners of His Majesty's Treasury, for the time being, in such manner and form as His Majesty, His Heirs and Successors shall be pleased to direct.

Volume the Eleventh Chapter XXIII 22nd March, 1823

IV. An Act to authorize the Commissioners, appointed for the completion of the Canal between Lachine and Montreal, to effect a Loan for that purpose, and to establish rates of Tolls to pass thereon.

9th March, 1824.

I. (Preamble. Commissioners empowered to effect a loan of money.)

Whereas it is expedient to adopt measures for the advancement and completing of the Lachine Canal, and for that purpose to enable the Commissioners for the said Canal to effect a Loan of Money under the authority of an Act of the Legislature;- Be it therefore enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Assembly of the Province of Lower Canada, constituted and assembled by virtue of and under the authority of an Act passed in the Parliament of Great Britain, intituled, "An Act to repeal certain parts of an Act passed in the fourteenth year of His Majesty's Reign, intituled, 'An Act for making more effectual provision for the Government of the Province of Quebec, in North America,' and to make further provision for the Government of the said Province;" - And it is hereby enacted by the authority of the same, that the Commissioners for the Lachine Canal appointed under and in virtue of an Act of the first year of His Majesty's Reign, intituled, "An Act for making a navigable Canal from the neighborhood of Montreal to the Parish of Lachine, and to appropriate a certain sum of money for that purpose, and to repeal a certain Act therein-mentioned," shall be, and they are hereby authorized for the purposes of the said Act, and for none other, from time to time, as occasion may require, to effect a loan or loans of money not exceeding in the whole the sum of twenty thousand pounds, currency, at such rate of interest not exceeding the legal interest, as they can obtain the same, to complete the said Canal to the neighborhood of and above the Port of Montreal, which said sum or sums of money, of which a loan or loans shall be obtained as aforesaid, shall be reimbursed and repaid at pleasure to the lender or lenders thereof, with the interest thereupon annually accruing, one year after the loan shall have been effected

and not later than five years thereafter, from and out of any unappropriated monies that actually are or that hereafter shall come into the hands of the Receiver-General of this Province.

II. (Interest due on money raised by loan payable half-yearly.)

III. (As soon as the Canal is navigable, certain rates of tolls to become payable. The rates.)

IV. (Fractions, how to be calculated.)

V. (Rates, &c. to be levied until 1st December, 1827, to be paid over to the Receiver-General. The monies raised by this Act to be accounted for to His Majesty.

VI. (Rates and dues to be paid to such person and at such places near the canal and under such regulations as the Commissioners may appoint.)

Volume the Eleventh Chapter XVI 9th March, 1824

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